The Economics of Money and Banking

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I. The Nature and Functions of Money and Credit

1. The Roles of Money

An individual need not be an economist to be acutely aware that money plays an important role in modern life; he need think only of his own experience and recall the headlines that have thrust themselves at him in recent years. From his personal experience he knows that the process of getting a living is a process of getting and spending money, and that how well he can live depends on how many dollars he can get and how many goods and services each dollar will buy. He also knows that dollars are harder to get at some times than at others, and that the buying power of each dollar has varied widely, sometimes to his benefit and sometimes to his injury.

When we recall the events of recent decades, we are reminded that the behavior of money is also vitally important to the operation of the national and international economy. During the 1930s newspapers headlined stories relating to "deflation": the drastic decline of output, job opportunities, and prices accompanying the shrinkage of effective money demand; the widespread want and suffering while millions of unemployed workers and other productive facilities that were both willing and able to work were standing idle because of insufficient "demand"; and wholesale failures of debtors to meet their obligations because of the decline of their money incomes and of the prices of their assets. Headlines in the 1940s told a different sort of story—not stories of deflation and shrunken employment, but stories of "inflation," of rising living costs, and of discontent and distress among those whose income and wealth were relatively fixed in terms of money. The 1950s were less unstable in the United States, but they included years of inflation, years of mild deflation with unemployment considerably above minimum levels, and widespread debate about the relation of monetary policies to our rate of economic growth. The 1960s have brought to the forefront still other issues. While most of the older problems remain unsolved,

we began to worry, for the first time in several decades, about the international position of the dollar—about the continuing deficit in our balance of international payments, the deterioration of our net international-reserve position, speculation against the dollar, and conflicts among the domestic and international objectives of our monetary policies.

In short, personal experience as well as some knowledge of history and economics makes it clear to almost everyone that money plays an important role in the economic system and that the behavior of money is somehow causally related to the behavior of employment, the rate of real output, the level of prices, the distribution of wealth and income, and so forth. What is not so clear, however, is the answer to such questions as these: Just what are the functions of money in the economy, and just how does money perform these functions? To what extent do economic disturbances "arise on the side of money and monetary policy"? To what extent do money and monetary policy amplify and spread through the economy disturbances originating in nonmonetary factors? What are the effects of the various types of money and monetary policies? Which ones promote economic objectives generally considered desirable, and which ones militate against the attainment of those objectives? With how much success can we use monetary policy to prevent unemployment, promote a steadily advancing level of output, and maintain a stable purchasing power of the dollar while preserving a basically free-enterprise economy?

Such questions are the central concern of this book. The primary interest throughout is in the functioning of the monetary, credit, and banking systems and in their relationships to the functioning of the economy as a whole. Though much space will be devoted to historical, structural, and legal aspects of the various institutions that create, transfer, and destroy money, these aspects will not be studied primarily for their own sakes, but rather for their contribution to our understanding of the functioning of the economic system.

THE BASIC FUNCTION OF MONEY

(Money has but one fundamental purpose in an economic system: to facilitate the exchange of goods and services—to lessen the time and effort required to carry on trade.)A man living and working in complete isolation from others has no use for money. He cannot eat it, or wear it, or use it to promote his productive processes; having no occasion to ex-

change either goods or services with others, he has no need for money. Even if a dozen persons lived together in isolation from all others, the use of money would be of only limited benefit to them; they could barter their goods and services among themselves with but little loss of time and effort. As groups become larger, however, and wish to increase their degree of specialization and the size of their trade area, they find the direct barter of goods and services increasingly inconvenient and increasingly wasteful of time and effort. They therefore search for something that will enable them to escape the wasteful processes of barter; they invent money.

We may say, then, that the sole purpose of money in the economic system is to enable trade to be carried on as cheaply as possible in order to make feasible the optimum degree of specialization, with its attendant increase of productivity. We are all familiar with the high degree of specialization that characterizes modern economies—specialization of persons, of business firms, of regions, and of types of capital. We know that without this high degree of specialization, which enables us to utilize the various regions to maximum advantage, to make the most advantageous use of native abilities, to develop skills, to amass huge amounts of specialized and useful knowledge, to employ large aggregations of specialized capital, and to achieve economies of scale, our productive powers and living standards would be far below their present levels. But this specialization would be impossible without an equally highly developed system of exchange or trade. Money is productive, therefore, in the sense that it is an essential part of the modern exchange mechanism and thereby facilitates specialization and production.

BARTER EXCHANGE

We have carefully avoided saying that exchange is impossible without money. People can, of course, carry on trade by a direct bartering of goods and services. Primitive trade was often carried on in this way, and bartering is not unknown even now. Yet pure barter is so wasteful of time and effort that little trade would be feasible if this were the only available method of exchange.

The first serious shortcoming of pure barter is the lack of any common unit in terms of which to measure and state the values of goods and services. (By the "value" of a good or service is meant its "worth," the quantity of other goods and services that it can command in the market.) In this situation, the value of each article in the market could not be

stated simply as one quantity, but would have to be stated in as many quantities as there were kinds and qualities of other goods and services in the market. For example, if there were 500,000 kinds and qualities of goods and services in the market, the value of each would have to be stated in terms of 499,999 others. Moreover, no meaningful accounting system would be possible. A balance sheet would consist of a long physical inventory of the kinds and qualities of the various goods owned and another inventory of those owed; consequently the net worth of the person or firm could be ascertained, if at all, only by a prolonged and tedious study of the numerous barter rates of exchange prevailing in the market. Profit and loss statements would be equally difficult to draw up and interpret. A firm could list only the various kinds and qualities of goods and services acquired during the period as income and those paid out as expenses, so that again the net results could be discovered, if at all, only by a laborious study of barter rates of exchange. It is almost inconceivable that even a small department store, not to mention General Motors Corporation, could keep meaningful accounts in the absence of a monetary unit.

The second serious disadvantage of barter is often called "the lack of a double coincidence of wants." Stated more simply, it would happen only rarely that the owner of a good or service that he wished to barter could easily find someone who both wanted his commodity more than anything else and possessed the commodity that our trader wanted more than anything else. For example, suppose that he owned a three-year-old draft horse that he wished to trade for a certain kind of two-wheeled cart. To find someone who already owned or could build with maximum economy exactly the kind of cart that he wanted and who would be willing to trade it, and who also wanted more than anything else the kind of horse that was being offered, would likely be a laborious and time-consuming process, if such a person exists at all. The horse owner would probably have to accept something that he wanted less than the cart, or else he would have to carry through a number of intermediate barter transactions; he might have to trade the horse for a cow, the cow for a boat, the boat for some sheep, and the sheep for the desired cart. Barter presents even more serious difficulties when the articles to be exchanged are not of the same value and cannot be divided without loss of value. Imagine, for example, the plight of the owner if he wanted to trade his horse for a pair of overalls, a hat for his wife, three dishes, an aluminum skillet, 50 cartridges, schoolbooks for his children, and numerous other inexpensive articles.

A third disadvantage of pure barter is the lack of any satisfactory unit in terms of which to write contracts requiring future payments. Contracts involving future payments are an essential part of an exchange economy; individuals must enter into agreements as to wages, salaries, interest, rents, and other prices extending over a period of time. But in a pure barter economy these future payments would have to be stated in terms of specific goods or services. Though this would be possible, it would lead to three grave difficulties:

1. It would often invite controversy as to the quality of the goods or services to be repaid.
2. The two parties would often be unable to agree on the specific commodity to be used for repayment.
3. Both parties would run the risk that the commodity to be repaid would increase or decrease seriously in value over the duration of the contract. For example, wheat might rise markedly in value in terms of other commodities, to the debtor's regret, or decrease markedly in value, to the creditor's regret.

A fourth disadvantage of pure barter, which results from its first two shortcomings, is the lack of any method or storing generalized purchasing power. People could store purchasing power for future use only by holding specific commodities or claims against specific commodities. This method of storing purchasing power has often been used, and as we shall later see, is used extensively even today. Yet it has serious disadvantages when it is the only method available. The stored commodity may deteriorate (or appreciate) in value, its storage may be costly, and it may be difficult to dispose of quickly without loss if its holder wishes to buy something else.

Because of the four disadvantages outlined above, pure barter is a highly inefficient means of trade. It was to overcome these difficulties that virtually every society invented some kind of money early in its development.

THE SPECIFIC FUNCTIONS OF MONEY

(Money serves its basic purpose as "the great wheel of circulation, the great instrument of commerce" by performing four specific functions, each of which obviates one of the difficulties of pure barter described above. These functions are to serve as: (1) a unit of value, (2) a medium of exchange, (3) a standard of deferred payments, and (4) a store of value. The first two are usually called the *primary* functions of

money. The last two are called *derivative* functions because they are derived from the primary functions.

Money as a Unit of Value

(The first function of money has been given many names,) of which the most common are "unit of value," "standard of value," "unit of account," "common measure of value," and "common denominator of value." (Through all these names runs one common idea: The monetary unit serves as the unit in terms of which the "value" of all goods and services is measured and expressed. As soon as a group develops a monetary unit, such as a dollar, (a peso, a franc, a pound sterling, or a pengö,) the "value" of each good or service can be expressed as a "price," by which we mean the number of monetary units for which it will exchange.) For example, we say that the "value" of a certain hat is $10, that beef of a certain grade has a "value" of $1.00 a pound, and so on. Ours is certainly a "pecuniary" society in the sense that values typically are measured and expressed in monetary units.

(The practice of measuring the values of goods and services in monetary units unquestionably simplifies the problem of measuring the exchange values of things in the market./One has merely to compare their relative prices in terms of monetary units. For example, if carbon steel is $8.00 per hundredweight and corn is $2.00 per bushel, a hundredweight of steel is worth 4 bushels of corn/It also simplifies accounting. Assets of all kinds, liabilities of all kinds, income of all kinds, and expenses of all kinds can be stated in terms of common monetary units to be added or subtracted./

Money is not the only common unit of measurement employed in the economic system. Units such as feet, inches, and meters are used to measure linear distance; ounces, grams, pounds, and short tons, to measure weight; gallons, liters, and barrels, to measure liquid volume; and so on. These units of physical measurement are themselves constant quantities. Confusion would surely result if these units of physical measurement, such as pints, inches, and ounces, should shrink 25 percent one year and expand 10 percent the next. Yet the unit of value (money), perhaps the most important unit of measurement in the economic system, has too often undergone wide fluctuations. The dollar has had a high value at one time (that is, an ability to purchase large amounts of goods and services in the market) and much lower values at other times (that is, an ability to buy only smaller quantities of goods and services). To be a satisfactory measure of value, the monetary unit itself must

maintain a relatively stable value, or purchasing power. Some of the consequences of a fluctuating monetary unit will be discussed later.[1]

Money as a Medium of Exchange

Various names have been given to the second function of money: "medium of exchange," "medium of payments," "circulating medium," and "means of payment." This function of money is served by anything that is generally (not necessarily universally, but very commonly) accepted by people in exchange for goods and services. The "thing" may be porpoise teeth, bits of gold, copper coins, pieces of paper, or credits on the books of a bank; the only essential requirement is that people in general be willing to accept it in exchange for their goods and services. When a group has developed such a mechanism, its members need no longer waste their time and energy in barter trade. Our horse owner can simply sell his horse to the person who will give him the most money for it and then buy the supplies that he most desires from those who will give him what he considers to be the best bargain. The Ford worker need not barter his bolt-tightening services directly for the various things that he needs; he can sell his services for money in the most favorable market and spend the money as he sees fit. In the last analysis all trade is, of course, barter; one good or service is traded indirectly for others, with money acting as the intermediary. But by serving this purpose, money greatly increases the ease of trade.

Money is often referred to as "generalized purchasing power" or "a bearer of options." This emphasizes the freedom of choice that the use of money affords. The owner of a good or service need not secure his supplies from the people to whom he trades his good or service; he can use his money to buy the things he wants most, from the people who offer the best bargain, and at the time he considers the most advantageous.

Here, again, money can function properly only if it maintains a rela-

[1] The succeeding sections implicitly assume that each of the "things" that actually circulate as money—that is used as a means of payment—is stated in terms of the unit of account and maintains a fixed market value in terms of the unit of account. For example, a certain piece of paper money is stated as $5.00 and actually passes in the market as five dollar units of account. In such cases a depreciation or appreciation of the purchasing power of the unit of account is accompanied by a proportional depreciation or appreciation of each of the things used as a means of payment. However, in some abnormal cases the things used as means of payment may fluctuate in value in relation to the unit of account. For example, a certain silver coin may be equal to one unit of account (say, $1.00) at one time and to two units of account (say, $2.00) at another time. In such cases the purchasing power of the unit of account and of each of the things used as a means of payment will not vary proportionally.

tively stable purchasing power. If a dollar is a bearer of fluctuating amounts of generalized purchasing power, it is likely to cause confusion and injustice in trade.

Money as a Standard of Deferred Payments

As soon as money comes into general use as a unit of value and a medium of payments, it almost inevitably becomes the unit in terms of which deferred or future payments are stated. Modern economic systems require the existence of a large volume of contracts of this type. Most of these are contracts for the payment of principal and interest on debts, in which future payments are stated in monetary units. Some of these contracts run for only a few days or a few months, many of them run for ten years or more, and some run for a hundred years or more. By the early 1960s, the volume of outstanding debt in the United States was nearly $1000 billion. There are also many contracts other than debts that require future payments which are fixed or semifixed in terms of monetary units: dividends on preferred stock, long-term leases on property, salary contracts, and so on.

The disadvantages of writing contracts for future payments in terms of specific commodities have already been noted. But money is a satisfactory standard of deferred payments only to the extent that it maintains a constant purchasing power through time. If money increases in value through time, it injures the groups who have promised to pay fixed amounts of money and gives windfall gains to those who receive these fixed amounts. If, on the other hand, money loses value through time, it injures those who have agreed to receive the fixed amounts and lightens the burden of payers.

Money as a Store of Value

We have already noted the disadvantages of holding specific commodities as a store of value. As soon as money comes to be used as a unit of value and as a generally acceptable means of payment, it is almost certain to be widely used as a store of value. The holder of money is, in effect, a holder of generalized purchasing power that he can spend through time as he sees fit for the things he wants most to buy. He knows that it will be accepted at any time for any good or service and that it will remain constant in terms of itself. Money is thus a good store of value with which to meet unpredictable emergencies and especially to pay debts that are fixed in terms of money. This does not mean that money has been a stable and wholly satisfactory store of value; it can meet this test only if its purchasing power remains constant. In

actual practice, it has performed this function most capriciously. Its value or purchasing power shrinks in periods of rising price levels and actually increases during periods of falling price levels.

Money is not, of course, the only store of value. This function can be served by any valuable asset. One can store value for the future by holding short-term promissory notes, bonds, mortgages, preferred stocks, household furniture, houses, land, or any other kind of valuable goods. The principal advantages of these other assets as a store of value are that they, unlike money, ordinarily yield an income in the form of interest, profits, rent or usefulness (as in the case of an auto or a suit of clothes), and they sometimes rise in value in terms of money. On the other hand, they have certain disadvantages as a store of value, among which are the following: (1) They sometimes involve storage costs; (2) they may depreciate in terms of money; and (3) they are "illiquid" in varying degrees, for they are not generally acceptable as money and it may be possible to convert them into money quickly only by suffering a loss of value.

Every person and business firm is free to choose for himself the form in which he will store his value, to determine the proportions he will hold in the form of money and in various nonmonetary forms, and to alter these from time to time to achieve what seem to him the most advantageous proportions, taking into consideration income, safety, and liquidity. These decisions are much influenced by a person's expectations as to the future behavior of prices. If he comes to believe that the prices of other things are less likely to decline and more likely to rise, he will be inclined to hold less of his wealth in the form of money and more in the form of other things. But if he comes to believe that prices of other things are less likely to rise and more likely to fall, he will be inclined to hold an increased part of his wealth in the form of money and a smaller part in other forms.

We shall see later that this freedom of people and business firms to determine for themselves the distribution of their holdings as between money and other assets and to shift freely from one form of assets to another may initiate or aggravate fluctuations in the flow of money expenditures and in prices and business activity. Sometimes people as a group show a tendency that is variously described as a desire to hold more of their wealth in the form of money and less in other forms, to use more money as a store of value and less as a means of payment, to transfer money from active use to idle balances, to hoard money, to hold money longer before spending it, or to decrease the velocity or rapidity of circulation of money. But regardless of the name applied to it, such a

development tends to decrease the flow of money expenditures for securities, goods, and services, thereby exerting a downward pressure on the national money income, employment, and price levels. On the other hand, a widespread tendency that has been variously described as a general movement to hold less wealth in the form of money and more in other forms, to use less money as a store of value and more as a means of payment, to transfer money from idle balances to active use, to dishoard money, to hold money only a short time before spending it, or to speed up the velocity or rapidity of circulation of money, serves to raise the rate of money expenditures and to raise money incomes, price levels, and under some conditions, employment and real output. Such fluctuations in the velocity of money, or the demand for money to hold, will occupy a very important position in our later discussions of the relationships between money and the behavior of the economy.

DEFINITION OF MONEY

Having considered the various functions performed by money, we must now ask, "What 'things' are included in money and what 'things' excluded?" Money should be defined precisely, for we shall deal at length with the supply (stock) of money and its behavior. Unfortunately it is impossible to find a completely clear-cut answer to this basic question.

Examples of Money

Anyone who begins his study of money with a belief that there is some one thing that is "by nature money" and that has been used as money at all times and in all places will find monetary history very disconcerting, for a most heterogeneous array of things has served as circulating media. An incomplete list is given in Table 1–1.

TABLE 1–1. An Incomplete List of Things that Have Served as Money

clay	goats	hoes	iron
cowry shells	slaves	pots	bronze
wampum	rice	boats	nickel
tortoise shells	tea	porcelain	paper
porpoise teeth	tobacco	stone	leather
whale teeth	pitch	iron	pasteboard
boar tusks	wool	copper	playing cards
woodpecker scalps	salt	brass	
cattle	corn	silver	debts of individuals
pigs	wine	gold	debts of banks
horses	beer	electrum	debts of governments
sheep	knives	lead	

Some of these things are animal, some vegetable, some mineral; some, such as debts, defy this classification. Some are as valuable for nonmonetary purposes as they are in their use as money; some at the other extreme have almost no value in nonmonetary uses. Some are quite durable; others much less so. About the only characteristic that all these things had in common was that each was able, at some time and place, to achieve general acceptability in payment. And the reasons for their general acceptability certainly varied from place to place and from time to time.

Legal Definitions of Money

Some have tried to define money in purely legal terms, contending that "money is what the law says it is." Legal provisions are certainly relevant. A "thing" is likely to have difficulty in achieving general acceptability in payments if the law prohibits its use for this purpose, though violations of such laws are far from unknown. Laws can also help a "thing" to achieve general acceptability by proclaiming it to be money. They may go further and endow it with "legal tender" powers, decreeing that it has the legal power to discharge debts and that a creditor who refuses it may not demand anything else in payment of an existing debt.

However, legal definitions of money are not satisfactory for purposes of economic analysis. For one thing, people may refuse to accept things that are legally defined as money, and may even refuse to sell goods and services to those who offer legal tender in payment. Moreover, things that are not legally defined as money may come to be generally acceptable in payment and even to become a major part of the circulating medium. Commercial-bank notes and deposits are an outstanding example. We must conclude, therefore, that legal provisions are an important, but certainly not the only, determinant of the things that do and the things that do not serve as money.

Functional Definitions of Money

To be useful for purposes of economic analysis, the definition of money must be in functional terms. Money includes all those things that perform the functions of money and excludes all others. But this definition raises still other questions, the principal of which is, "performs what functions?" Two of the functions—those of serving as a unit of value and as a standard of deferred payment—do not help us determine which "things" to include in the money supply and which to exclude, for they are abstract units that can relate to many different "things." For example, we could measure values in "dollars" whether or not our money, de-

nominated in dollars, was composed of gold, paper money, or porpoise teeth. And we could state contracts extending over time in "dollars" without reference to the nature of the "things" to be used in payment.

Virtually all economists agree that we should include in the money supply all those things that are in fact generally acceptable in payment of debt and for goods and services. If a thing is in fact generally acceptable in payment and generally used as a medium of payments, it is money, whatever may be its legal status.

Applying this criterion to the United States money, our supply includes at least coins, paper money, and demand deposits (or checking deposits) at banks. All our coins and paper money are not only generally acceptable in fact; they are also endowed with full legal tender powers to discharge debts. Checking deposit claims against banks do not have legal tender powers, but they are in fact generally acceptable as payment. Perhaps as much as 90 percent of all payments in this country are made by transferring from payors to payees deposit claims against banks, the transfers being effected by checks or other orders on banks. The checks or other orders are only the means of effecting transfers; the things transferred as money are deposit claims against banks.

Throughout the remainder of this book we shall define the money supply in this restricted sense. The public's money supply includes only its holdings of coin, paper money, and checking deposits. As indicated in Table 1–2, coins are indeed the "small change" of the monetary sys-

TABLE 1–2. The Public's Money Supply, February 28, 1963 (in millions)

Type of Money	Amount Outstanding	Percent of Total
Coins	$ 2,773	1.8
Paper Money	31,507	20.9
Demand (checking) deposits	116,400	77.3
Total	$150,680	100.0

SOURCE: *Federal Reserve Bulletin*, April, 1963, pp. 493–494. The table actually overstates the amount of coin and paper money in the hands of the public. About $3000 million of the amount shown above was in the vaults of commercial banks, for whom it served as a part of their legal reserves.

tem, comprising less than 2 percent of the total money supply. Paper money makes up another 21 percent, but checking deposits are by far the largest component, representing more than 77 percent of the total. All these things are generally acceptable and generally used in making payments and are also used as a store of value.

We shall later have occasion to refer to "moneyness." This relates to the characteristics of money itself, defined in our restrictive sense. Money

remains constant in terms of monetary units and can be used for making payments without delay or other costs. "Moneyness" is therefore a protection against loss in terms of money and against the delay, inconvenience, and other costs that may be involved in exchanging some other asset for money.

Near-Moneys or Moneys?

Many economists consider our definition of money too restrictive. They admit that only coins, paper money, and checking deposits are generally accepted in payments, but they prefer to expand the money category to include some other things that have a high degree of "moneyness" and are widely used as a store of value. None would include everything used as a store of value; the concept of money would become meaningless if expanded to include land, structures, livestock, business inventories, and other such risky and illiquid assets. But they would include time and savings deposits at commercial, mutual savings, and postal savings banks; claims against credit unions; and shares of savings-and-loan associations. Some would go further and include U.S. Treasury bills and other short-term debts of the federal government and even short-term debts of safe private debtors.

These things are not generally acceptable in payment, they yield an income to their holders, they are not legally payable on demand, and in most cases there is at least a short delay or other cost in exchanging them for "money" in the sense in which we have defined it. Yet they do indeed have a high degree of "moneyness" or "liquidity." Their value ordinarily fluctuates only very narrowly in terms of money, and they can be exchanged for coin, paper money, or checking deposits quickly and at little cost other than the sacrifice of the income that they yield.

Those who favor a broader definition of the money supply believe these things should be included because a dollar held in these forms may affect the willingness and ability of the public to spend almost as much as would a dollar of money in our restricted sense. As almost perfect substitutes for money as a store of value, and superior in the sense that they yield an income, the availability of these assets reduces the quantity of money proper used by the public as a store of value and releases more of it to be used as a medium of exchange or payments. In other words, less of money proper is immobilized in serving the store of value function, so that more of it can be used to make payments. A given money supply can support a high level of spending.

We do not deny that the availability of these "near-moneys" can affect the behavior of the rate of money spending. Nevertheless we shall

for several reasons stand by our earlier definition of money.

1. Since all assets possess the quality of moneyness in varying degrees, any other definition would leave equally troublesome borderline cases.

2. We doubt that a dollar's worth of these assets affects the public's willingness to spend as much as does a dollar's worth of money proper.

3. At times it is the purpose of monetary policy to make it more expensive or less expensive to exchange these assets for money proper. For example, it may be desirable to force people to take losses or to sacrifice more interest income if they try to exchange government securities for money proper.

4. The rate of spending depends not only on the supply of money and other liquid assets but also on many other things, such as the people's total wealth, both liquid and illiquid, their expectations as to future wealth, income, and price levels, the availability and cost of credit, and so on. To include these other liquid assets in the money supply, simply because they affect the rate of spending, would raise questions as to why all determinants of the spending rate were not also included.

Though we exclude these near-moneys from our definition of the money supply, we shall not ignore their effects on the behavior of the rate of spending. We include these in our analysis by taking into account the public's demand for money balances. We shall argue that the behavior of spending depends not only on the supply (stock) of money but also on the demand function of the community for money balances. The characteristics and quantities of near-moneys will thus enter the equation as one, but only one, of the determinants of the community's demand function for money balances.

THE UNPRECEDENTED IMPORTANCE OF MONEY

Money is by no means a recent invention. It is certainly as old as recorded history, and some form of it seems to evolve as soon as a group finds a significant amount of specialization and exchange advantageous, which is usually early in group life. Nor are monetary problems less ancient; historians have yet to find a society with a perfectly functioning money, and many of the ancient monetary disorders were serious. Yet money is of unprecedented importance in modern capitalistic economies. This is due to two interrelated factors: (1) the unprecedented extent of specialization and exchange, and (2) the nature of economic motivations under capitalism.

The rapid rise of specialization and trade in the United States has been outlined by Walton Hamilton:

In the United States in fewer decades than the fingers on the hands has occurred a social revolution. An economy of small farms and petty trade, with a bit of commerce on the fringe, has been converted into "the great industry." At the end of the Civil War there was a coastal plain with a few cities, a back country with a dotting of small towns, and a West which invited settlement. The small, all but isolated, farm was dominant. The family, committed to a subsistence agriculture, undertook to produce their own livings with their own hands and formed an all-but-priceless economy. The household group was well or poorly off as they were hard working, prudent, thrifty, and had the break of the seasons. The weather could bountifully give or stingily withhold; for, because of an undeveloped technique in agriculture, it was still nature and not the market which made years fat or lean. The face of the land was covered with these almost self-contained entities. Almost—for the town was near at hand, to which the farmer took his surplus of produce; discovered the strange phenomena of the market, money, and price; engaged in verbal combat in haggling over a bargain; established an indirect contact with places far removed; and brought away tobacco, tools, and the subscription to the county weekly.[2]

Even in the period before the Civil War, money was not unimportant in this country. The farmer's enjoyment of life, if not his possession of necessities, depended to a considerable extent on the prices of farm products, the prices of the things he bought, and the real burden of his money debts. Moreover, there were already many people in the towns and cities whose dependence on money and markets was greater than that of the farmer. Yet, as Hamilton indicates, the farmers were to a considerable extent self-sufficient, and even the city dwellers were less dependent on money and markets than they are today. A social revolution has indeed occurred since that time. In 1840 about 70 percent of our people lived on farms; this figure has now dwindled to less than 10 percent and may fall still farther. And farming itself has experienced a revolution. The self-sufficient farm family is now the rare exception; to a constantly increasing extent, the farmer is a specialized businessman, producing for sale in the market and relying on the market for a large part of the equipment and supplies with which to carry on production, as well as for most of the things with which to satisfy his family's wants. He, too, gets a living by obtaining money for his production and spending the money for tractors, implements, building materials, gasoline, automobiles, clothing, food, and other supplies and services. Any lingering illusion that the American farmer was independent of the market vanished during the great depression following 1929. The great numbers of our people who are engaged in mining, manufacturing, transportation, communication, marketing, and service are almost completely dependent on markets and money. For them, getting a living is a process of securing

[2] Walton Hamilton, *Price and Price Policies*, New York, McGraw-Hill, 1938, p. 7.

money in return for their specialized goods or services and then spending it for the things they want. Anything that disrupts the flow of their money income is likely to cause serious suffering and frustration.

A second reason for the unprecedented importance of money in the United States and other countries with similar types of economic systems is to be found in the nature of economic motivations in a capitalistic system. Money and monetary policy cannot safely be neglected even in a collectivistic society such as Soviet Russia, which relies primarily on centralized physical planning and direction of employment, output, and distribution. Time after time, central planners have been embarrassed by excessive or deficient money flows that create dissatisfaction and militate against the success of their master plan. But money and monetary policy are inescapably more powerful forces in a capitalistic, free-market economy. The leaders in this system are the enterprisers—those who determine the policies of business firms, whether these are individual proprietorships, partnerships, corporations, or cooperatives. They are the ones who determine whether or not to establish plants, the size and location of plants, the types of goods to be produced, the rate of output, the amount of employment to be offered, and the demand for capital equipment. Their motivation is to "make money," as much money as possible; and they make goods and services only to the extent that this process will contribute to their primary objective of making money profits. If the flow of money spendings for their output is so great relative to their costs as to enable enterprisers to maximize their money profits by using all the available productive factors, something like full employment will be attained. If, however, money spendings for their output are so small relative to their costs that they will maximize their profits or minimize their losses by stopping far short of full output, they are likely to leave large numbers in the ranks of the unemployed. If the flow of expenditures for their products rises when almost all available factors of production are already fully employed, they are almost certain to raise their prices. Such fluctuations of money expenditures are likely to be accompanied by fluctuations not only in employment and real output but also in price levels. This brings us to the difficult subject of the causative role of money.

MONEY AS A CAUSATIVE FACTOR IN THE ECONOMY

We must neither underestimate nor overestimate the influence of money and monetary policy on the functioning of an economic system. Many of the writings of the so-called "classical" economists who domi-

nated British and American economic thinking in the nineteenth and early twentieth centuries tended to accord money only an unimportant causative role. Such a view of the significance, or rather the insignificance, of money was clearly stated by John Stuart Mill:

> It must be evident, however, that the mere introduction of a particular mode of exchanging things for one another by first exchanging a thing for money, and then exchanging the money for something else, makes no difference in the essential character of transactions. . . .
>
> There cannot, in short, be intrinsically a more insignificant thing, in the economy of society, than money; except in the character of a contrivance of sparing time and labor. It is a machine for doing quickly and commodiously, what would be done, though less quickly and commodiously, without it; and like many other types of machinery, it only exerts a distinct and independent influence of its own when it gets out of order.
>
> The introduction of money does not interfere with the operation of any of the Laws of Value laid down in the preceding chapters. The reasons which make the temporary or market value of things depend on the demand and supply, and their average and permanent values upon their cost of production, are as applicable to a money system as to a system of barter. Things which by barter would exchange for one another, will, if sold for money, sell for an equal amount of it, and so will exchange for one another still, though the process of exchanging them will consist of two operations instead of only one. The relations of commodities to one another remain unaltered by money; the only new relation introduced is their relation to money itself; how much or how little money they will exchange for; in other words how the Exchange Value of money itself is determined.[3]

Three aspects of Mill's statement should be noted before jumping to the conclusion that money deserves no more attention than each of the thousands of other labor-saving devices in the economy. First, he conceded that money "exerts a distinct and independent influence of its own when it gets out of order." This suggests the importance of keeping money "in order" to avoid disturbances. Second, he was speaking primarily of "equilibrium conditions"—those conditions that would rule after sufficient time had elapsed for all factors of production, output, costs, and prices to become so adjusted that there would be no incentive for further changes. Third, he was assuming that, at least in the long run, there was no "money illusion" and that both money wage rates and prices were perfectly flexible. That is, he assumed that decision-makers responded, not to the absolute level of a price, but to relative prices—the price of what they sold relative to the prices of things they bought, which are the barter terms of trade. He also assumed that money wage rates adjusted flexibly to demand and supply conditions in labor markets and that prices adjusted flexibly to changes in costs.

[3] John Stuart Mill, *Principles of Political Economy*, Book III, chap. 7, p. 3.

Modern economists tend to accord money and monetary policy a more prominent role in their analysis. In the first place, they believe money is frequently, if not virtually always, "out of order," in the sense in which Mill used the term. They have not even succeeded in defining satisfactorily the requirements of a "neutral" monetary policy, one that would not itself influence the behavior of an economy, but would enable it to function exactly as would a highly efficient barter economy without money. And actual monetary policies are rarely, if ever, neutral; instead, they tend continuously to push the economy one way or another.

In the second place, economists now give much more attention to conditions and periods of disequilibrium: to business cycles, periods of unemployment or inflation, and periods of transition from one equilibrium position to another. The late Lord Keynes once quipped, "In the long-run we are all dead." This does not suggest that long-run consequences are unimportant, but it does emphasize that we cannot afford to neglect "short runs" or disequilibrium conditions. These may persist for long periods and have serious social consequences. This is especially true if money wage rates are inflexible downward, even in the face of unemployment, and if prices of output do not decline flexibly with cost levels. Under such conditions, a decline in aggregate spending for output may be reflected not only in a decline of the price level, but also, and perhaps to a greater extent, in lower real output and in unemployment of labor and other productive factors. And a rise of expenditures for output, if it occurs when the economy is operating far below its capacity levels, can elicit increases in both output and employment, though the rise of demand is likely to be reflected increasingly in prices as output approaches capacity levels. Thus, money, monetary policy, and anything else that influences the rate of aggregate expenditures can affect not only the price level, or the "exchange value of money itself," but also such real variables as employment and output.

To overemphasize the role of money and monetary policy can be as dangerous as to underemphasize it. Some reformers, noting that the ability of an individual to obtain goods and services depends on the amount of money he can command, have erroneously assumed that the same must always hold true for an entire nation. They would therefore abolish poverty and usher in the economic millennium by great expansions in the money supply. How wonderful it would be if we could all become rich in any real sense simply by creating great batches of money! Unfortunately, it is not all that easy. We have already noted that an expansion of money spendings may serve to expand real production if it occurs in a period of unemployment when the labor force and other

productive factors are not working at full capacity. Economic policy must not ignore this fact. But neither can it safely ignore the fact that the most that monetary policy can do to promote production—and it may not accomplish this without the aid of other wise economic policies—is to achieve and maintain full employment. It cannot compensate for a paucity of natural resources, or a scarcity of capital goods, or a backward state of technology, or sluggish and unintelligent labor, or unimaginative and unenterprising economic management, or inefficiency in government economic activities. In other words, a wise monetary policy may help to raise and maintain the actually realized rate of production closer to potential productive capacity (though we should not assume that it can always achieve even this objective), but it usually is not one of the major determinants of this potential capacity. Nor is it by any means the only factor determining the distribution of income and wealth among the members of the community. We shall have wiser monetary policy, and certainly wiser economic policies as a whole, if we recognize its limitations as well as its power.

2. Debt and Credit

We can understand the functioning of money and our monetary institutions only if we understand the nature and functions of debt or credit, and the instruments representing them. We shall later find that debt or credit serves in many ways:

1. All our money is composed of particular types of debt that have somehow achieved the status of general acceptability in payments. Thus, our coins may be looked upon as evidences of debt issued by the federal government, our paper money is, in effect, the debt obligations of the Treasury and Federal Reserve, and checking deposits are demand debts of commercial banks.
2. The bulk of our payments is made by transferring deposit debts from payors to payees through the use of credit or debit instruments known as drafts, or orders to pay.
3. Our monetary institutions create and issue money predominantly by purchasing assets in the form of debts, and they withdraw and destroy money predominantly by making net sales of assets in the form of debts.
4. Credit or debt creation plays a major role in transferring funds from savers to spenders, and thus in financing investment and maintaining a circular flow of income.

THE NATURE OF CREDIT OR DEBT

Debt and credit are merely the same thing looked at from two different points of view. They are an obligation to pay in the future, and since money is so widely used as a standard of deferred payments, they are usually obligations to pay a fixed sum of money. From the point of view of the person to whom the future payment is to be made, the obligation is a credit; it is his claim against another for payment. But from the point of view of the one who is obliged to pay in the future, the obligation is a debt. Since debt and credit are but the same thing looked at from different points of view, it is obvious that the amount of debt outstanding at any time is equal to the amount of outstanding credit,

and that the amount of each is the sum of existing obligations to pay in the future.

Credit or debt usually originates in economic and financial transactions in which creditors surrender something of value at one point of time in exchange for debtors' promises to pay in the future. We ignore here debts that may arise out of gifts of promises to pay in the future. The "something of value" surrendered may be money, services, goods, or some sort of financial claim such as stocks or bonds. However, the resulting debt is usually payable in money. We are all familiar with the creation of debt by the sale of goods or services "on credit." For example, Mrs. Jones buys groceries, promising to pay at the end of the month. A corporation gets raw materials from its suppliers with the understanding that it will pay at the end of the quarter. Much of the outstanding debt at any time has arisen from such "extensions of credit" by sellers of goods and services. Most of the remainder has arisen out of money-lending transactions in which creditors surrendered money at one point of time in exchange for promises of debtors to pay later, usually with interest. These money-lending transactions range all the way from the simple case in which Joe lends Bob $5.00 until payday to the much more complicated one in which a large public-utility corporation borrows $500 million, giving in return its bonds, which carry its promise to pay the principal at the end of a stated number of years and to pay interest at 4 percent annually. Thus, it is often said that the creation of credit (or debt) involves the exchange of present goods or purchasing power against future goods or purchasing power, interest being paid by the borrower for the privilege of having the goods or purchasing power sooner.

The Bases of Credit

The ability of any person, business firm, or governmental unit to get credit depends on the potential creditors' faith that the borrower will be both able and willing to pay. The popular statement that "Smith's credit is worth half a million" means he is believed to be both able and willing to pay at least that amount. The statement that "his credit is bad" indicates lack of faith in either his ability or his willingness to pay. In determining an applicant's credit worthiness, credit analysis emphasizes the three "C's"—character, capital, and capacity to acquire income. The relative importance of these elements varies from case to case.

Character is a major determinant of a debtor's ability to obtain credit. Creditors analyze carefully an applicant's past record in meeting his obligations; his general reputation for honesty, his police record, his

likelihood of becoming involved in damage suits of any kind, his marital status, his drinking habits, and any other characteristics or associations that might bear upon his ability or willingness to pay. Anyone who acquires a reputation for paying his debts only when forced by the courts to do so is likely to lose his ability to command credit no matter how rich he may be.

Credit analysts also scrutinize both the value and character of an applicant's assets, noting especially the probable stability of their value and their liquidity—their ability to be sold for money quickly and without loss of value. Other things being equal, an applicant whose assets have a high stability of value and a high degree of liquidity is more likely to obtain credit easily than can one whose assets are less liquid and fluctuate more widely. Since a potential creditor is interested primarily in the applicant's *net capital position*, he investigates the applicant's other debts as well as his assets.

The size of an applicant's future income is another major determinant of his ability to obtain credit. We all know of cases in which credit was extended, even though the borrower lacked capital, on the basis of his expected income. Thus, a man with a steady job may buy on credit, a governmental unit borrows against expected revenue, or a business firm secures credit because of the lenders' faith in the ability of its management to make earnings. On the other hand, doubt as to an applicant's future income is likely to reduce his ability to obtain credit. A major part of all credit extensions is based on the expectation that the debt will be paid out of future income rather than from the sale of assets. This is partly because assets may have little value if they cannot be made to yield an income. For example, a factory or railroad that cannot be made to yield an income may have only salvage value, whatever may have been its cost of construction.

In most cases an applicant's ability to obtain credit depends on his own credit worthiness as determined by factors such as those already noted. Sometimes, however, one may borrow on the basis of guarantees given by others. A friend endorses Joe's note, promising "to make it good" if Joe fails to pay. A giant corporation guarantees the bonds of its subsidiaries. A bank guarantees payment by one of its customers. The Federal Housing Administration guarantees payment of a home mortgage. We shall find later that there are many ways in which a debtor's friends or relatives, or his bank, or his business associates, or the government can bolster his ability to secure credit by lending their own credit worthiness.

Since debts are promises to pay at some future date, credit worthiness

depends upon potential creditors' expectations as to future asset values and income levels. These expectations may fluctuate widely. When, as in a period of prosperity, lenders in general expect future asset values and income levels to remain high and perhaps to rise further, they may be willing to lend liberally. But when, as in depression periods, they become pessimistic and fear falling asset values and shrinking money incomes, they may become less willing to take new debts and may insist on repayment of some of those already outstanding. Such fluctuations in expectations relating to credit worthiness may aggravate fluctuations in income flows in our credit-debt economy, as we shall see later.

Types of Credit or Debt

Though credit or debt can be classified on many bases, we shall mention only four:

1. *On the basis of the nature of the debtor.* A broad classification on this basis would be individual debt, business debt, and government debt. A more detailed classification on this basis could be complex indeed, for almost every type of person and organization in our society incurs debt at one time or another.

2. *On the basis of the nature of the creditor.* Here, too, a more detailed classification is possible, but we shall mention only credit extended by (debts taken by) individuals, commercial banks, other financial institutions, nonfinancial businesses, and the government.

3. *On the basis of the purpose for which the debt was created.* "Consumption credit" (or "debt") is that created in the acquisition of money, goods, or services for consumption purposes. *Production* or productive debt is that created in the acquisition of money, goods, or services to aid in the process of production: to meet payrolls, to purchase inventory, to cover costs of storage and transportation, or to purchase land, buildings, and equipment to be used in production.

4. *On the basis of the length of time elapsing between the time the debt is created and the time it is to be retired.* On this basis debts are: (a) long term—over five years, (b) intermediate term—one to five years, (c) short term—less than a year, or (d) payable on demand.

A cross-classification of debt on these various bases suggests how varied is our debt structure, how complex our creditor-debtor relationships, and how pervasive the use of debt in our society.

Table 2–1 greatly understates the total amount of debt in the American economy because it leaves out debts of financial institutions and certain other duplications of debt and shows only the net debts of the

various nonfinancial sectors. However, it does emphasize the huge amounts of debt used by these sectors and suggests the importance of debt in the functioning of the economy. The table also brings out some other important facts: the decrease in almost all types of debt except

TABLE 2–1. Net Public and Private Debt in the United States (end of year figures in billions of dollars)

Type of Debt	1929	1939	1945	1962
Federal government	$ 16.5	$ 42.6	$252.7	$ 256.8
State and local government	13.2	16.3	13.7	72.0
Corporate debt	88.9	73.5	85.3	330.8
Farm debt	12.2	8.8	7.3	29.3
Total noncorporate, nonfarm debt except consumer debt	53.7	34.8	41.7	248.7
Consumer debt	6.4	7.2	5.7	63.1
Total debt	$190.9	$183.2	$406.3	$1000.7

SOURCE: *Economic Report of the President*, January, 1963, Washington, D.C., U.S. Government Printing Office, 1963, p. 234.

that of the federal government during the great depression of the 1930s, the huge rise of the federal debt between 1939 and the end of 1945, and the great increase of almost all debt except that of the federal government since the end of World War II. Many feel sorry for the debtors, who at the end of 1962 owed more than $1 trillion. Before succumbing to grief, however, we should ask several questions. Are these debtors and the country as a whole worse off because these debts were incurred? May not the transactions in which these debts were incurred have been of such a nature as to create wealth and income?

THE FUNCTIONS OF DEBT OR CREDIT

Debt does not, despite its widespread use, enjoy unqualified approval. Many people are sympathetic with, even though they do not heed, Shakespeare's admonition, "Neither a borrower nor a lender be." They speak lugubriously of "the burden of debt," refer in unflattering terms to those who "live on credit," and express fears that "the nation will borrow itself into serious trouble." Such attitudes are not solely reflections of puritanism or of opposition to "usury" in all its forms. Too many individuals, business firms, and governments have been guilty of unwise use of this powerful instrument. But instances of its unwise use should not be allowed to obscure the great benefits that debt can yield.

Benefits to Creditors

Credit or debt can benefit lenders in at least two ways. In the first place, it enables them to earn income on their savings. This not only benefits the individual saver-lender, but may also benefit society to the extent that it stimulates saving and that saving is socially beneficial. In the second place, but no less important, it may help the saver-lender get greater total utility or satisfaction from his lifetime income by deferring consumption from a time when it would yield less satisfaction to a time when it will yield more satisfaction. He first foregoes some consumption and saves and lends; later he "dissaves" by selling his debt claim and using the proceeds for consumption, getting greater satisfaction.

Consumption Credit

Debt created for consumption purposes can benefit the debtor by enabling him to augment his consumption when additional consumption has a high utility to him and to repay later when the dollars have less utility to him, either because his income becomes higher or his needs lower. For example, a person may go into debt to secure goods and services during a period of illness or unemployment or to meet other urgent extraordinary needs, repaying later with dollars that have less utility to him. Personal debt may also be productive. For example, a person who borrows to finance his education may thereby increase his productivity and lifetime income by amounts far greater than the debt and the interest on it.

Productive Debt

A major part of the outstanding debt has been created as the financial counterpart of the creation of capital goods. We could, of course, create some capital goods without the creation of debts or any other financial claims. For example, each saver could use his own savings to finance the creation of capital goods that he would own and operate. But such a system would be highly inefficient. For one thing, some savers would lack the willingness or ability, or both, to undertake the creation of capital. In such cases, an act of saving, if it occurred, might not lead to capital creation. But even if they did use their savings to buy capital goods that they would own and operate, the result might be low productivity because the savers would in many cases be less efficient than others in the use of capital. Total output, the income of savers, and the net income of enterprises can be increased by transferring funds from

savers to those who can use them most productively. Those who wish to spend for productive purposes have two principal ways of getting the money from others:

1. *By selling ownership claims.* Though a considerable part of business expenditures is financed in this way, many savers are unwilling to assume the risks involved in becoming owners of business, not even the risks of part-ownership involved in buying shares of corporate stock.

2. *By creating and selling debt claims.* They borrow the money to produce or buy capital goods, expecting thereby to increase their income by an amount greater than their interest payments. Thus, as already noted, much of the creation of capital goods has as its necessary counterpart the creation of financial claims, either ownership claims or debt claims.

Debt and the Circular Flow of Income

In later chapters, we shall deal at length with the highly important roles of credit or debt in determining the behavior of national money income. At this point, we shall discuss these functions in only general terms. At high levels of employment, we save large amounts of our national money income. Saving is simply that part of our income which we do not spend for consumption. Thus an act of saving—of not spending for consumption—taken by itself tends to be deflationary. This may be expressed in two ways:

1. It tends to decrease the flow of expenditures for output. The process of income creation and use is a circular flow process. Money received as income is spend back into the market for output, which creates money incomes for producers and their employees; this money income is respent for output, which creates money income for recipients; and so on. An act of saving, of not spending for consumption, tends to shrink this circular flow.

2. Saving tends to hold down the demand for consumers' goods and to fail to employ in the consumers' goods industries some part of the supply of labor and other productive factors. These factors are freed for other uses, such as the production of capital goods. But saving merely frees factors for other uses; it does not assure that they will actually be used elsewhere. The released factors will be employed elsewhere only if attracted by a sufficient demand for their potential products.

Saving by some members of the community will actually shrink the flow of national money income unless the money saved is injected back into the spending stream by others and unless saving by some is offset by the deficit spending of others. This can occur in three principal ways:

1. *By "dissaving"; that is, by others consuming in excess of their current incomes.* In effect, the savers transfer consuming power to those consuming beyond their current incomes. Such transfers frequently involve the creation of debt by the dissavers, though to get the necessary money, they may transfer to others some of their existing assets, such as shares of stock or debt claims against others.

2. *By government deficit spending; that is, government spending in excess of its current income.* This almost always involves a creation of government debt to get the required money.

3. *Through spending by business firms for "investment" (for current output with which to maintain or increase their stock of capital goods) to produce or buy new plants, durable equipment, inventories, and the like.* These three general uses are the only "offsets to saving," the only channels through which saving, representing the part of income not respent for consumption, can be reinjected into the spending and income stream.

We find, in short, that we can achieve and maintain a level of national money income consistent with practically full employment and relatively stable price levels only if saving by some members of the community out of that level of income is offset by deficit spending of other individuals, governmental units, and business firms. This requires the transfer of money savings from savers to spenders. Such transfers can be achieved through the creation of ownership claims or debt claims. Roughly speaking, debt should grow each year by an amount equal to the amount saved out of a full-employment-without-inflation level of national money income minus the amount of saving transferred through the creation of new ownership claims. If debt grows less rapidly than this, the flow of national money income will fall and the economy will be depressed. If it grows more rapidly, the flow of national money income will rise faster than real output and inflation will probably result. This analysis will be elaborated and refined later.

CREDIT OR DEBT INSTRUMENTS

By a *credit* or *debt instrument* we mean a "thing" that represents the existence and terms of a debt. It indicates the identity of the debtor, the amount of the debt it represents, and arrangements as to maturity, interest rates, and so on. More or less formal evidences of debt are highly useful even when the original creditor intends to hold the debt claim throughout its life and to collect it himself at its maturity. Such instruments can obviate controversy over the existence, amounts, and terms

of a debt, and serve as valuable evidence if legal action becomes necessary. These instruments greatly enhance the transferability or marketability of debt claims. Many lenders do not want to commit themselves to hold a debt claim throughout its life. They fear that in the meantime they will need money for their own use, or they wish to be able to sell the particular claim and buy others as circumstances change. Debt claims may be hard to sell in the first place, or can be sold only at high interest rates, if they are not expected to be transferable quickly and at low cost. Even a short-term debt claim may have numerous holders during its life. Many types of debt instruments are so designed as to maximize their salability, and laws to facilitate this have been evolved.

Not all outstanding credit or debt is evidenced by a written contract. We have all been parties to "parole credit" transactions in which the agreement to pay was purely oral. Such arrangements have their disadvantages even when the sums are small and the principals are close friends or business associates. They are usually quite unsatisfactory in transactions involving large sums and less intimate relationships. A large volume of debt is evidenced only by "book accounts" or "book credits." Bank deposits fall in this category; the bank's debts to depositors are evidenced by entries on the bank's books, though depositors have such evidence as their deposit slips and canceled checks. Sellers of goods and services also use entries in their books as evidence of their debt claims. For example, a college student's debt to his tailor is usually evidenced only by an entry in the tailor's ledger; the tailor's debt to his supplier of woolens is evidenced only by an entry in the supplier's books; and so on. Such debt claims are sometimes sold by creditors, but they are usually less salable than pieces of paper clearly stating the debtor's unconditional obligation to pay.

Credit instruments can be sold whether they are *nonnegotiable* or *negotiable*. Nonnegotiable credit instruments are those whose rights are governed by the general common and statute laws of contract, whereas negotiable instruments enjoy special advantages conferred by the negotiable instruments laws.[1]

Under the general common and statute laws of contract that govern nonnegotiable instruments, title is transferred from one owner to another by assignment only.

> In assignment, only the assignor's title is transferred, so that the assignee gets only such title as his assignor possessed, and any defense existing at the time of

[1] For a good discussion on this general subject, see C. N. Hulvey, *Commercial Law*, New York, Macmillan, 1930, chap. 9.

the assignment, whether by reason of breach of warranty, set-off, recoupment, or fraud in the inducement, can still be used against the assignee.

At the present day, an assignee takes no better right or title than his assignor possessed; he is said "to stand in the shoes of his assignor" and is subject to all defenses which the obligor possessed against the assignor.[2]

For these reasons, nonnegotiable paper should be purchased only with full knowledge of the various conditions surrounding its creation. Some of the dangers involved in purchasing nonnegotiable paper can be indicated by an example. Suppose that Smith buys a car from the Ajax Motors Company, giving in return his written but nonnegotiable promise to pay $1000 at the end of three months. Suppose also that this paper is transferred by assignment from the Ajax Motors Company to Reilly, who then transfers it by assignment to Johnson. As holder of the paper, Johnson runs several risks. In the first place, Smith may legally refuse to pay him, claiming that the car was not as warranted, that the Ajax Motors Company owed him $500 that should be offset against this debt, or that he was fraudulently induced to issue the promise to pay. In short, Smith may refuse to pay Johnson for any of the reasons that would have excused him from making full payment to the Ajax Motors Company. In the second place, Johnson runs the risk that Reilly had found or stolen the note, for Johnson gets no better title to it than Reilly had.

It was for reasons of this sort that, even as early as the Middle Ages, merchants, traders, financiers, and others dealing in credit found nonnegotiable paper inconvenient. To facilitate their operations, they needed credit instruments that were unconditional obligations to pay and that could be freely bought and sold without the usual doubts concerning title. To satisfy this need, a new branch of law evolved; it culminated in the negotiable instruments laws. Credit instruments that meet the specifications of these laws are known as *negotiable instruments.*

To be negotiable, an instrument must meet the following requirements:

1. It must be in writing.
2. It must be signed by the maker or drawer.
3. It must be an unconditional promise or order to pay a certain sum of money.
4. It must be payable on demand or at a fixed or determinable future date.
5. It must be payable to order or to bearer.

Most of the foregoing requirements are self-explanatory. Instruments that meet them are written and signed unconditional promises or orders to pay a fixed sum of money at a fixed or determinable future time.

[2] *Ibid.*, pp. 173–174.

Special attention should be given to the terms "bearer" and "order," for paper failing to contain at least one of them is not negotiable. An instrument promising or ordering payment to "bearer" or to "John Smith or bearer" is payable to any "holder in due course." An instrument promising or ordering payment to "John Smith or order" or "to the order of John Smith" is payable either to John Smith or to anyone to whom he transfers title by endorsement. In fact, it becomes payable to bearer if John Smith endorses it in blank by signing his name.

A *holder in due course* of a negotiable instrument has a title to the instrument that is nearly perfect. Such a holder "in due course" is one who has taken the instrument under the following conditions:

1. The instrument is complete and regular upon its face.
2. He became the holder of it before it was overdue, and without notice that it had previously been dishonored, if such was the fact.
3. He took it in good faith and for value.
4. At the time it was negotiated to him he had no notice of any infirmity in the instrument or defect in the title of the person negotiating it.

A holder in due course not only has a nearly perfect title to the negotiable instrument, but he is also free from all debtor's defenses mentioned above in connection with nonnegotiable instruments. The debtor retains only the defense that the instrument never had a legal existence because of such reasons as forgery, alteration, or infancy of the maker.

Title to negotiable instruments is transferred not by assignment but by *endorsement*. Such instruments payable to bearer require no endorsement for negotiability, though a buyer may, of course, ask for one. It is important to note that one who gives an unqualified endorsement to a negotiable instrument in effect warrants that:

1. The instrument is genuine and in all respects valid.
2. He has good title to it.
3. He has no knowledge of any fact that would impair the validity of the instrument or render it valueless.
4. If on due presentment it is dishonored by the debtor, the endorser will pay the holder or any subsequent endorser who may be compelled to pay it.[3]

There are three general classes of unqualified endorsements: (1) blank endorsement, (2) endorsement to a specified person or order, and (3) restrictive endorsement. To illustrate each, let us take the case of a promise or order to "Pay to John Smith or order." If Smith endorses it in blank, merely signing "John Smith," the instrument is, in effect, made payable to bearer; it becomes freely negotiable without further endorse-

[3] We shall not discuss qualified endorsements here. On this subject, see Hulvey, *op. cit.*, pp. 174–180.

ment. If he endorses it by writing "Pay to Sam Jones" or "Pay to Sam Jones or his order," and signs his name, the instrument is not further negotiable without endorsement by Sam Jones. If he writes "Pay only to Sam Jones," and signs his name, the instrument at this point loses its negotiability.

Owing to the ease of transferring title by endorsement and the ample protection given to holders in due course, negotiable instruments are easily and widely bought, sold, and exchanged.

Credit instruments are divided in two broad classes: promissory notes, and bills of exchange, or drafts. Both nonnegotiable and negotiable credit instruments fall into these two categories, but we shall discuss here only those that meet the requirements of the negotiable-instruments laws.

Promissory Notes

A promissory note is an unconditional statement in writing made by one person to another and signed by the maker, promising to pay on demand, or at a fixed or determinable time in the future, a stated sum of money to order or to bearer. When a note is drawn to the maker's own order, it is not complete until endorsed by him. Several aspects of this definition should be noted carefully.

1. The promise to pay must be in writing.
2. The promise to pay must be unconditional.
3. The amount to be paid must be certain in terms of money.
4. The note must be payable on demand, at a fixed time, or at a determinable time.
5. The note must be payable to bearer or to the order of a specified person.

All these conditions must be met if the note is to be negotiable.

There are at least two parties to a promissory note: the *maker* or payer, and the *payee*. In some instances, the maker and the payee are the same person, the maker promising to pay himself or his order and then endorsing the note so that it becomes negotiable. The payee may be "bearer" or a specified person. Subsequent purchasers of the note become involved as holders and often as endorsers. Figure 2-1 shows the general form of a simple promissory note. Though all negotiable promissory notes contain these elements, they vary greatly in other respects. They differ as to the time elapsing before maturity; that is, some mature only after a long period of years, some in a year, some in a few months or weeks, and some are payable on demand. Some are secured; others, unsecured. Some are issued by corporations, some by governments, some by banks, and so on.

Bills of Exchange, or Drafts

In contrast to promissory notes, which are promises to pay, bills of exchange, or drafts (both are the same), are orders to pay. "A bill of exchange is an unconditional order in writing addressed by one person to another, signed by the person giving it, requiring the person to whom it is addressed to pay on demand or at a fixed or determinable future time a sum certain in money to order or to bearer.[4] There are three parties to a draft: the *drawer*, or the one who orders payment; the *drawee*, or the one who is ordered to pay; and the *payee*, or the one to whom payment is ordered to be made. In most cases, the three parties are different persons; thus, Jones (the drawer) may order Smith (the drawee) to pay to the order of Thompson (the payee). In other cases, only two persons are involved, the drawer and the payee being the same. Thus, Jones may order Smith to pay to the order of Jones. In a few cases, drawer, drawee, and payee are the same person. Thus, Jones may order himself to pay himself or order and then make the draft negotiable by endorsing it.

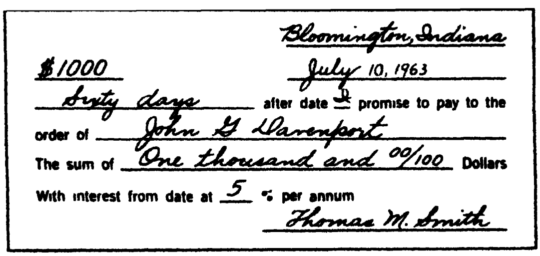

Bloomington, Indiana
$1000 July 10, 1963
Sixty days after date I promise to pay to the
order of John G Davenport
The sum of One thousand and 00/100 Dollars
With interest from date at 5 % per annum
Thomas M. Smith

FIG. 2–1. A Simple Negotiable Promissory Note.

Drafts or bills of exchange are classified on several bases, of which we shall explore only a few of the most important. One basis for classifying drafts or bills is the type of drawee involved. Thus, an order on a bank to pay is a *bank draft* or *bank bill*, or a *banker's draft* or *banker's bill*. An order to any other type of drawee to pay is a *trade draft* or *trade bill*.

Drafts or bills are also classified on the basis of the amount of time elapsing before payment is to be made. A draft ordering payment "on demand" or "at sight" is known as a *sight draft* or *sight bill*, or a *demand draft* or *demand bill*. A draft ordering payment after a lapse of time is known as a *time draft* or *time bill*. Time drafts fix the time of payment in three general ways. Some state a specific date of payment in the future.

[4] Section 126 of the Negotiable Instruments Law.

Others accomplish the same thing by requiring payment a stipulated number of days after the date of drawing the draft. Still others require payment a certain number of days "after sight," that is, after the bill has been presented to the drawee. This last method is largely a legacy of the period when both land and water transportation were so irregular as to make forecasts of dates of arrival unreliable.

Before discussing time drafts, let us look at the form and use of sight or demand drafts. In the sight trade draft shown in Fig. 2–2, the drawer (Fisher) ordered the drawee (Strong) to pay to the order of the payee (Smith) $2000 at sight. This draft may have had any one of several purposes. It may have been used to clear debts. If Fisher owed Smith $2000 and Strong owed Fisher the same amount, all the debts could be

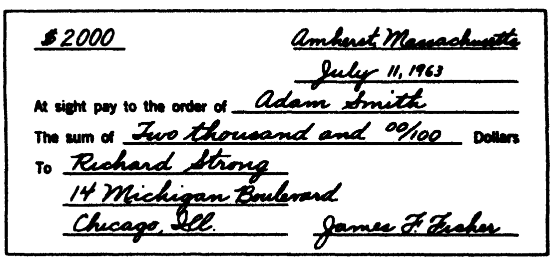

$2000 Amherst Massachusetts
July 11, 1963
At sight pay to the order of Adam Smith
The sum of Two thousand and 00/100 Dollars
To Richard Strong
14 Michigan Boulevard
Chicago, Ill. James F. Fisher

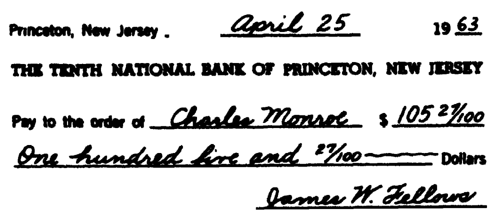
FIG. 2–2. A Simple Sight or Demand Trade Draft.

cleared by having Strong pay Smith or his order. The draft could have been used to force Strong to pay for supplies before he received title to them. For example, Fisher may have shipped maple syrup to Strong by Smith's truck and ordered payment before delivery of title. Such a draft can also be used as a means of "putting pressure" on a slow-paying debtor. Suppose, for example, that Strong has bought $2000 worth of syrup from Fisher on book credit and has refused to pay or has blithely ignored numerous requests for payment. By drawing a draft on Strong and then routing it through Strong's bank for collection, Fisher can put Strong in the position of having to pay or of letting his bank discover his untrustworthiness. This use of trade bills for "dunning" purposes has reduced their popularity in this country.

The appearance and use of a sight bank draft (Fig. 2–3) should be familiar to everyone, for bank checks belong in this category.

The check shown in Fig. 2–3 is of the type that might be drawn upon a bank by one of its depositors. Such checks may be unacceptable in some cases because of doubt that the drawer has a deposit account at the bank or that he will have sufficient deposits to cover the check when it is

presented. Other types of instruments have been developed to obviate these difficulties. One is the *certified check*. This works as follows: The depositor draws a check on his bank and presents it to an appropriate official of the bank of certification. When the official stamps "certified" on the check and signs his name, he attests in effect that a sufficient amount of the depositor's account has been set aside to cover the check. About the same thing could be accomplished by the use of a *cashier's check*. In this case, the depositor writes a check ordering the bank to pay a stipulated amount out of his account to the bank itself. The cashier or another authorized official of the bank then writes a draft ordering the bank to pay the payee. Thus, the actual payment is made with an order by a banker on a bank rather than an order by a depositor on a


Princeton, New Jersey . April 25 19 63

THE TENTH NATIONAL BANK OF PRINCETON, NEW JERSEY

Pay to the order of Charles Monroe $ 105 27/100

One hundred five and 27/100 Dollars

James W. Fellows

FIG. 2–3. A Sight Bank Draft.

bank. But the final results are the same: The payer loses a deposit claim and the payee gains one.

Orders by bankers on banks are used to make a very large volume of payments. Thus, an officer of a Dallas bank may order his own bank to pay, either to make payments for the bank's own account or to pay for the account of a customer. Or, he may draw an order on a New York bank with which his bank has a deposit account. Or, he may draw an order on a London bank with which his bank or his New York correspondent bank has a deposit account. Though these orders to pay are most commonly communicated by written orders similar to the ordinary check, they are sometimes transmitted by telegraph or cable.

It is important to note that a draft, as such, is only an order to pay; it is not an obligation of the drawee to pay. In fact, you can draw a draft on any person or firm, but the mere drawing of the draft does not obligate the drawee to pay. The order to pay can be converted into a binding unconditional obligation to pay through *acceptance* by the drawee. The drawee *accepts* the order to pay by writing on either the face or the back of the draft the word "accepted" and by affixing his signature and

the date of acceptance. Thus, the drawee may accept the draft in Fig. 2–4 by writing on it:

Accepted, May 4, 1963
The Lowell Blanket Company
By: Cabot L. Lawrence, Treasurer

By this act, the drawee transforms the trade bill into a *trade acceptance*, which is his unconditional obligation to pay $10,000 to Davis or his order 60 days after the date of acceptance.

Acceptances are widely used in finance and trade, though they are not as popular in the United States as in some foreign countries. To illustrate their use in financing trade, let us follow through a specific transaction. Our example will be simpler than many actual transactions. Suppose that the Lowell Blanket Company purchases $10,000 worth of

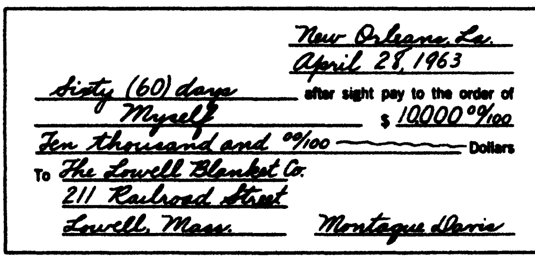

New Orleans, La.
April 28, 1963
Sixty (60) days after sight pay to the order of
Myself $ 10000 00/100
Ten thousand and 00/100 Dollars
To The Lowell Blanket Co.
211 Railroad Street
Lowell, Mass. Montague Davis

FIG. 2–4. A Time Trade Draft or Bill.

wool from Montague Davis, a wool merchant in New Orleans. The buyer does not wish to pay until 60 days after receiving the wool. The seller does not wish to surrender title to the wool until he has received from the buyer a negotiable, unconditional obligation to pay.

The problem may be solved somewhat as follows: Davis draws on the Lowell Blanket Company the draft shown in Fig. 2–4, ordering the company to pay $10,000 to him or his order 60 days after sight. He also arranges that the Lowell Company shall not gain title to the wool until it accepts the draft. When the draft is accepted, the Lowell Company gets the wool, but does not have to pay until 60 days later. Davis has acquired an unconditional debt claim, which he can sell in the market for face value less interest at the prevailing rate for 60 days. Who pays this interest? It was probably taken into account in fixing the price of the wool. Credit to finance this transaction was provided by the holder of the acceptance, which may be a bank or any other type of lender. In fact, the acceptance may have several holders during its life, each supplying credit during the period he held the paper.

A trade acceptance is a highly convenient and negotiable instrument when the drawee is widely known and enjoys an excellent credit standing. It is less satisfactory when these conditions are not met. For such reasons, buyers and sellers often try to use a bank acceptance, which is a bill of exchange drawn upon and accepted by a bank. Let us see how a bank acceptance could be used to finance the transaction we have just described. The Lowell Company may go to the National Shawmut Bank of Boston to secure a *letter of credit*. This letter of credit will contain the bank's promise to accept the draft drawn on it in accordance with an agreement concerning the amount of the draft, the time of shipping the wool, and so on. The bank will issue the letter of credit only if it is satisfied that the Lowell Company will place in its hands the required

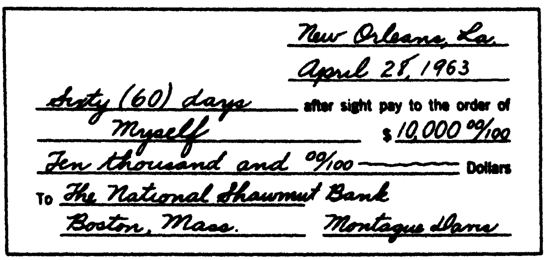

New Orleans, La.
April 28, 1963
Sixty (60) days after sight pay to the order of
Myself $ 10,000 00/100
Ten thousand and 00/100 Dollars
To The National Shawmut Bank
Boston, Mass. Montague Davis

FIG. 2–5. A Time Bank Draft.

amount of money before the draft matures. The letter of credit will be sent to Davis. He will then draw against the National Shawmut Bank a draft similar to that in Fig. 2–5, and will arrange that the bank shall not get title to the wool until it accepts the draft. When the bank has accepted the draft and received title to the wool, it will turn the latter over to the Lowell Company. Davis now has an unconditional debt claim against a bank of impeccable credit standing, a claim that is readily salable in the market. It should be noted that the bank is obligated to pay whether or not the Lowell Company keeps its promise to provide the money before the acceptance matures.

It is interesting to note the role played by the National Shawmut Bank in this transaction. At no time did it lend money unless, of course, the Lowell Company failed to meet its obligation or the bank elected to buy and hold the claim against itself. Instead, it substituted its credit standing for that of the Lowell Company, thereby increasing the ability of the textile firm to secure credit from other lenders. For this it received a small acceptance fee.

In the succeeding chapters, we shall refer frequently to various points

that have been brought out with respect to credit, debt, and credit or debt instruments. We shall pay special attention to:

1. Those specific types of debts that we call money because they have come to be generally acceptable in payments.
2. Demand drafts on banks, which are used to transfer deposit claims on banks from payers to payees.
3. The many types of debt instruments that are not themselves money but are bought and sold by our monetary institutions in the process of creating and destroying money.
4. The role of debts in transferring money savings from savers to spenders, in facilitating the process of capital formation, and in influencing the level of national money income.

INTEREST

Debts that are themselves money usually do not yield interest. Most others do. Debtors are ordinarily required to pay not only the amount they received when they borrowed, but also something in addition. In some cases, interest rates are easy to state and compute. For example, if Jones borrows $100 and repays $106 a year later, we can say that the interest rate is 6 percent per year. The $6.00 of "something in addition" is 6 percent of the amount received by the borrower. The rate of interest is almost always stated on an annual basis. We shall see later that the computation of effective interest rates or yields can be highly complicated in some cases.

Variety of Interest Rates

At various times we shall refer to "the" interest rate, which suggests that there is but one interest rate in a given market at a given time. This is a useful device, making for simplicity and brevity of exposition. But we should always remember that this is an oversimplification, and one that can be dangerous for our analysis. The fact is that, at any point of time, there is not just one interest rate, but a complex of rates in the market, and that these can differ widely. Moreover, these various rates may not move in a parallel manner through time, though they usually move in the same direction.

How can such differences in rates persist? Why do not lenders shift their funds from debts with low yields to those with higher yields until all yield differentials have been wiped out? A part of the answer is to be found in imperfections in the credit market, which inhibit the mobility of loan funds from one branch of the market to another. Some of the most important of these are lack of knowledge by lenders or borrowers,

legal limitations on the types of loans that can be made by some financial institutions, differing degrees of monopoly power in the various branches of the market, and so on. The actual structure of rates cannot be fully understood without reference to such imperfections. But these do not by any means provide a full explanation of the variety of yields; yields would still differ even if the credit market were perfectly competitive, with credit perfectly mobile. This is true because the debts themselves have such differing characteristics. Some of the most important factors that would cause yields to differ even in a perfectly competitive market follow.

1. Differences in costs of administration per dollar of loan per year. Interest charges usually include costs of investigating the credit worthiness of the applicant, of holding the loan, and of collecting principal and interest. On some loans, these costs are very low per dollar per year. For example, the administrative cost per dollar on a very large loan to a business firm whose credit standing need not be investigated may be almost negligible. On the other hand, such costs per dollar of loan per year may be very high on small installment loans to a consumer whose credit standing must be investigated and interest and principal collected in weekly or monthly installments.

2. Differences in risk. This risk is of two types. The first is the risk that the debtor will fail to pay principal and interest. Different debts of the same debtor may differ in degree of risk. One debt may have prior claim on assets and income or be amply secured by pledged collateral. Another may be only a general claim against the debtor's assets and income and may be payable only after other debt claims have been satisfied. Risks obviously vary widely among different debtors. A loan to the United States government is far less risky than one to a struggling business firm whose future is uncertain. The second type of risk is often called "the market risk"; that is, the risk that the market value of the debt claim will change because of changes in the level of interest rates in the market. Even if there is no change in expectations relative to a debtor's willingness and ability to pay a debt, the market value of the obligation will fall if interest rates rise, or its market value will rise if interest rates fall. In general, debt obligations with a long maturity are subject to wider fluctuations in market value than are those that are short term, as we shall see later.

3. Differences in liquidity. Because of their own nature and the organization of the market, some debts can be sold quickly, at very small cost, and with little effect on price. Others are far less liquid. For example, a short-term obligation of the United States government can be

sold almost instantaneously in the well organized market, dealers' margins are small, and large amounts may be sold with little effect on price. But even the safest conventional home mortgages do not enjoy these advantages.

4. Differences in taxability. For example, the fact that income yielded by securities issued by states and municipalities is exempt from the federal income tax enables these obligations to be sold at lower yield rates.

Because of these differences, we should expect to find a variety of yields on different debts in the market at any point of time. A calculating lender thoroughly familiar with all market opportunities would be willing to take lower gross yields on some debts than on others.

Yield Rates and Market Values

We return now to two points raised earlier: the calculation of effective interest rates or yields and the relationship between the rate of yield and the market value of a debt obligation.

We can best approach the problem of calculating effective interest rates by distinguishing three different types of "yield." The first is the *nominal yield*, which is simply the yield stated on the face of the obligation. Thus, a note promising to pay $100 at the end of a year with interest at 3 percent has a nominal yield of 3 percent. A bond promising to pay $1000 at the end of ten years and $30 at the end of each year also has a nominal yield of 3 percent. The nominal yield is of importance primarily in fixing the *dollar amount* of interest to be paid each year. The nominal yield and the effective rate of interest will be the same only if the market value of the debt is equal to its par or stated value, and this may not occur. In fact, the debt may not even have been sold initially at its par or stated value. For example, when the debtor originally issued his promise to pay $1000 at the end of ten years and $30 of interest at the end of each year, interest rates in the market on comparable obligations may have been below 3 percent, so that the bond could be sold above par, say, for $1050. Or, interest rates on comparable obligations may have been well above 3 percent, so that he had to sell the bond below par, say, for $950. In any case, the market value after issue can deviate from par value.

Another type is the *current yield*. This is simply the dollar amount of interest per year divided by the current market price of the obligation. If the bond described above has a market value of $950, its current yield is $30/$950, or 3.15 percent. If its market price is $1050, its current yield is $30/$1050, or 2.85 percent. Though current yield is more meaningful than nominal yield, it does not measure accurately the average *net*

return per year to be gained if the obligation is purchased at its current market price and held to maturity. This is best reflected by *yield to maturity*, which takes into consideration the current market value, annual interest receipts, and the relationship between current market value and the value at which the debt will be paid off at maturity. The general nature of this measure can be explained most easily by an example using simple interest rather than compound interest. Suppose that one buys the 10-year bond described above at $950. He will receive not only $30 a year in interest but also a capital appreciation of $50 over the 10-year period, or an average of $5.00 per year. Thus, his average return per year will be $35 and his average yield to maturity will be $35/$950, or 3.68 percent. Suppose, however, that the market price of the 10-year bond is $1050. In such a case, the buyer must recognize that his average net return will not be $30 a year; from this he must deduct an average of $5.00 per year because he paid $1050 for the debt and will collect only $1000 at maturity. Thus, his average net return per year will be only $25, and the average yield to maturity will be $25/$1050, or 2.38 percent. This is only approximate because we used simple interest; in practice, buyers would use compound interest. We shall do this later.[5]

When we refer hereafter to yields, to effective interest rates, or simply to interest rates, we shall mean rates of yield to maturity because that is the best measure of the rate of return on debt obligations at any time.

We now deal with the relationship at any point of time between yield rates and the capital value (market value) of a debt obligation or any other income-yielding asset. The present capital value of such an asset is arrived at by a process of *capitalization*, by which we mean "discounting" the expected flow of money receipts. *Discounting* means taking out interest in advance. A buyer who paid for an obligation the full amount of its future dollar returns would receive no net interest at all. He usually will not buy an obligation unless the purchase price is such that the yield on the purchase price will be as great as that available to him on other comparable obligations. Of course he would like to buy at a lower price, but this is likely to be prevented by competition from other purchasers.

The discounting process is easiest to understand when only simple interest or discount is involved. Suppose that, when the market yield on this class of paper is 3 percent, buyers are offered a promise to pay $1030 one year later. Each buyer will reason as follows: This piece of paper is of value today only because it represents a claim against money re-

[5] This example assumes that the debtor does not have the option of paying off the debt before maturity. If the issuer has the option of "calling" it before maturity, at some stated price, the buyer should also compute "yield to call date," to determine what his rate of net return will be if the security is called.

ceivable in the future. I will buy it only at such a price that I will receive the going rate of return on my money, and this "price" is that amount which, if put out at the prevailing yield rate, would be worth \$1030 a year hence. There is some amount of money (P), which, if put out at the current rate of yield (i) on this type of obligation, will be worth \$1030 a year later. Thus,

$$P(1+i) = \$1030$$

or

$$P = \frac{\$1030}{1+i}$$

If $i = 0.03$, the formula becomes

$$P = \frac{\$1030}{1.03} = \$1000$$

The present value of \$1030 receivable a year hence will be lower if yield rates are higher, and higher if yield rates are lower. For example, if the yield rate is 4 percent, the formula becomes

$$P = \frac{\$1030}{1.04} = \$990.38$$

If, however, the yield rate is 2 percent,

$$P = \frac{\$1030}{1.02} = \$1009.80$$

The general formula for simple discount is $P = A/(1+i)$, where P is the present value, A is the dollar amount receivable at the end of the interest period, and i is the rate of interest for that period stated in hundredths, such as 0.02 or 0.04.[6]

The process of arriving at a present capital value for a longer-term obligation, such as the bond described above, is based on the same principle, but it is a bit more complicated, for two reasons. First, the obligation is to make a number of payments through time rather than a single payment; second, it involves compound interest or discount. Each prospective buyer will reason as follows: this obligation is of value only because it represents a claim against \$30 at the end of each of the next 10 years and \$1000 at the end of the 10-year period. I will buy it only at such a price that I will receive the going rate of return on my money. The price (P) is the sum of the discounted values of all the individual payments expected in the future. For example, there is some amount of money (P_1) which, if put out at the prevailing yield rate, would be

[6] Here and later we shall assume that the interest period is one year and that the interest rate is the rate per year. We shall also assume that interest is compounded annually. In some cases, the interest period is less than a year. For example, it may be six months. In such cases the i in our formula will be the interest rate for half a year and the number of interest periods will be twice as large as it would be if the interest period were one year.

worth \$30 a year hence. That is, $P_1\ (1+i) = \$30$, or $P_1 = \$30/(1+i)$. There is another smaller amount of money (P_2) which, if put out at compound interest at the prevailing rate, would be worth \$30 at the end of 2 years. Compound interest is used because during the second year I would receive interest on the first year's interest. That is, $P_2\ (1+i)^2 = \$30$, or $P_2 = \$30/[(1+i)^2]$. Similarly, there is a yet smaller amount of money (P_3) which, if put out at compound interest, would be worth \$30 at the end of 3 years. $P_3\ (1+i)^3 = \$30$, or $P_3 = \$30/[(1+i)^3]$. The present values of the other interest payments can be arrived at in the same way. There remains the \$1000 of principal payable at the end of 10 years. Its present value is $\$1000/[(1+i)^{10}]$. The present value of the bond is the sum of the present values of the various payments to be received on it.

The general formula for arriving at present capital value by discounting is

$$P = \frac{A_1}{1+i} + \frac{A_2}{(1+i)^2} + \frac{A_3}{(1+i)^3} + \cdots + \frac{A_n}{(1+i)^n} + \frac{F}{(1+i)^n}$$

where P is the present value, the A's are the dollar amounts receivable at the ends of the various interest periods, F is the amount of the principal repayment, i is the rate of discount, and n is the number of interest

TABLE 2–2. Discounting and Present Values

End of Year	Formula	Values of Col. 1 at Interest Rates of:			Present Values[a] of \$30 at End of Indicated Years at Discount Rate of:		
	(Col. 1)	2% (Col. 2)	3% (Col. 3)	4% (Col. 4)	2% (Col. 5)	3% (Col. 6)	4% (Col. 7)
1	$(1+i)$	1.0200	1.0300	1.0400	\$ 29.412	\$ 29.126	\$ 28.846
2	$(1+i)^2$	1.0404	1.0609	1.0816	28.835	28.278	27.737
3	$(1+i)^3$	1.0612	1.0927	1.1249	28.270	27.454	26.670
4	$(1+i)^4$	1.0824	1.1255	1.1699	27.715	26.655	25.644
5	$(1+i)^5$	1.1041	1.1593	1.2167	27.172	25.878	24.658
6	$(1+i)^6$	1.1262	1.1941	1.2653	26.639	25.124	23.709
7	$(1+i)^7$	1.1487	1.2299	1.3159	25.605	23.682	21.921
8	$(1+i)^8$	1.1717	1.2668	1.3686	25.103	22.992	21.197
9	$(1+i)^9$	1.1951	1.3048	1.4153	26.117	24.393	22.798
10	$(1+i)^{10}$	1.2190	1.3439	1.4719	24.610	22.323	20.382
Subtotal					\$ 269.48	\$ 255.90	\$243.56
Present value of \$1000 receivable at the end of 10 years					820.35	744.10	679.38
Total					\$1089.83	\$1000.00	\$922.94

[a] The values in columns 5, 6, and 7 are arrived at by dividing \$30 by the numbers shown in columns 2, 3, and 4, respectively.

periods. Fortunately, each potential buyer need not solve such equations for himself; bond tables, easily available, have done this for him.

Columns 5, 6, and 7 of Table 2–2 show the present value of the bond at discount rates of 2, 3, and 4 percent. It will be worth \$1000 if the rate is 3 percent, only \$922.94 if the rate is 4 percent, and \$1089.83 if the rate is 2 percent.

One special case is worth noting because of its simplicity: the case of an obligation to pay fixed annual amounts in perpetuity. In this case, the preceding formula becomes simply

$$P = \frac{A}{i}$$

Thus, the present value of the right to receive \$30 a year in perpetuity becomes:

1. If the discount rate is 3 percent,

$$P = \frac{\$30}{0.03} = \$1000$$

2. If the discount rate is 2 percent,

$$P = \frac{\$30}{0.02} = \$1500$$

3. If the discount rate is 4 percent,

$$P = \frac{\$30}{0.04} = \$\ 750$$

It is important to note that the longer the maturity of an obligation, the greater is the effect of any given change of market rates of interest on its present value. This is illustrated by the following examples:

	Present Value if Discounted at		
	3%	2%	4%
An obligation to pay \$1030 at the end of 1 year	\$1000.00	\$1009.80	\$990.38
An obligation to pay \$30 annually for 10 years and \$1000 at the end of 10 years	1000.00	1089.83	922.91
An obligation to pay \$30 a year in perpetuity	1000.00	1500.00	750.00

CONCLUSIONS

Several of our findings with respect to yields and market prices of debt obligations will be useful to our later analysis.

1. The wide variety of debts in the market and differences in their

yields pose policy problems to commercial banks and all other dealers in these obligations. Such investors must constantly weigh differences in yields against differences in such attributes as costs of administration, risks, liquidity, and taxability. To get higher yields, they must usually take debts whose other characteristics are less desirable; to get claims whose other attributes are more favorable, they must usually take lower yields.

2. As we discuss periods of "tight money" and "easy money," it will be useful to remember that rising interest rates are reflected in declining prices of outstanding debt obligations and that falling interest rates are reflected in rising prices of these obligations. As interest rates rise, newly issued obligations are likely to carry increased nominal yields. For example, the stated interest on new bonds may rise from 3½ to 4 percent. Outstanding obligations whose nominal yield is fixed by contract can become equally attractive only if their prices fall. The opposite occurs in periods of falling interest rates. Nominal rates on new issues fall; outstanding obligations whose dollar returns are fixed by contract rise in price.

3. The fact that any given change in interest rates affects the prices of long-term obligations more than the prices of shorter-term obligations should be remembered for at least two reasons. In the first place, it helps to explain why some lenders, such as commercial banks, who want to avoid decreases in the value of their assets, tend to confine their loans to short terms. Though they may buy some long-term obligations, they tend to keep them to a small part of their total holdings, especially when they fear that interest rates may rise. In the second place, this fact helps to explain why yields on short-term debts tend to fluctuate more widely than do yields on longer-term obligations, especially when the rise or fall of rates is expected to be only temporary. Consider the case in which there is a large excess supply of loan funds but this situation is not expected to be permanent. Lenders may make their funds available at very low rates on short-term loans. The commitment is for only a few months, and any subsequent rise of rates would only slightly decrease the market values of these short-term obligations. On the other hand, lenders would not lend at such low rates for long periods, such as 10 or 20 years. They would not want to be committed to such low rates for so long a period. Moreover, a subsequent rise of rates might lower the market prices of long-term obligations so much as to offset interest receipts for several years.

Now consider a case in which there is a large excess demand for loan funds relative to the supply, but this condition is expected to be tem-

porary. If lenders lend for short terms, they will have the advantage of high rates for only as long as market yields are high. But if they lend for long terms, they will have the advantage of high rates for all the years covered by the debt contract. This provides an opportunity for capital gains as interest rates decline later. For these reasons, loanable funds are likely to be divided between short-term and long-term loans in such a way as to cause short-term rates to rise more than long-term rates in periods of credit tightness.

The foregoing analysis is applicable when the fall or rise of rates is expected to be short lived. It may not be valid if investors expect the initial decline or rise of rates to be followed by still further movements in the same direction.

3. Kinds of Money

MONEY STOCKS AND MONEY FLOWS

We should constantly bear in mind the distinction between the *supply* or *stock* of money, and money *flows*. The supply of money is simply the stock of those things that are used as media of exchange or means of payments, the size of this stock being measured in terms of the country's unit of account or unit of value. In the United States, this is the sum of the public's holdings of coin, paper money, and checking deposits at a stated time. Thus, the money supply is stated as the stock in existence at a point in time. This stock may, of course, be increased or decreased from one point of time to another. On the other hand, money spendings or expenditures are *flows* per unit of time. These flows are usually expressed at annual rates. Thus, we may say that spending for American output is at an annual rate of $600 billion. We may state these flows at annual rates even though we are speaking of a point in time. For example, the foregoing statement that spending for output is at an annual rate of $600 billion might apply to "right now"; the rate may have changed by tonight.

It is the flow of money expenditures rather than the money supply that is most directly relevant to the behavior of output, employment, and prices. In determining their policies relative to output, hiring, and prices, producers and sellers are most interested in the current and prospective flow of money demand for their products. They have no such direct concern for the size of the money stock. Nevertheless, we shall, for two reasons, begin with a long discussion about the money supply. We shall show (1) that the size of the stock of money is a major determinant of money flows, and (2) that, under the conventions of our society, the stock of money is subject to more direct official control than is its velocity. The rapidity of turnover of money is determined by people's decisions as to holding versus spending their money receipts, and as to

how long they will hold money before spending it. Direct government control of these individual decisions is not considered acceptable. But it is generally conceded that governments should regulate, if not control with precision, the supply of money. From a public-policy point of view, it is sometimes useful to concentrate attention on those factors in a situation that are subject to control. Moreover, we shall see that it may be possible to regulate the money supply in such a way as to offset, at least in part, fluctuations emanating from changes in the velocity of money.

TYPES OF MONEY

Money can be classified on several different bases, such as the following: (1) the physical characteristics of the materials of which money is made; (2) the nature of the issuer, such as a government, central bank, commercial bank, or other; and (3) the relationship between the value of money as money and the value of money as a commodity. We shall use all these classifications, but it will be convenient to start with the third. Table 3–1 shows the various types of money on this basis.

TABLE 3–1. Classifications of Money

I Full-bodied money
II Representative full-bodied money
III Credit money
  A. Issued by government
    1. Token coins
    2. Representative token money
    3. Circulating promissory notes
  B. Issued by banks
    1. Circulating promissory notes issued by central banks
    2. Circulating promissory notes issued by other banks
    3. Demand deposits subject to check

Since 1933, the United States has had only credit or debt money, both full-bodied and representative full-bodied money were discontinued and withdrawn at that time. The latter two should be analyzed, however, for they have played important roles in monetary history and are still remembered nostalgically by many people.

Full-Bodied Money

Full-bodied money is money whose value as a commodity for nonmonetary purposes is as great as its value as money. Most of the early commodity moneys, such as cattle, rice, wool, and boats, were as valuable for nonmonetary purposes as they were in their monetary uses. The

principal full-bodied moneys in modern monetary systems have been coins of the standard metal when a country is on a metallic standard: a gold standard, a silver standard, or a bimetallic standard using gold and silver. We shall use gold in our examples, but the same principles apply to full-bodied money made of any other commodity.

Full-bodied coins need not be issued by governments. This function could be, and in a few cases has been, entrusted to private enterprise with some regulation of the purity and weight of the coins to prevent cheating. In most cases, however, governments have retained a monopoly on the issue of full-bodied coins. Three steps are involved:

1. Define the gold value of the monetary unit. This may be done in either of two ways, but both amount to the same thing: Stipulate the gold content of the monetary unit or stipulate the money price of each unit of gold. For example, for many years before 1933 the federal government defined the dollar as 23.22 grains of fine (pure) gold. This amounted to setting a price of $20.67 per ounce of fine gold because an ounce of gold (480 grains) will yield $20.67 of 23.22 grains each.
2. At the stipulated price, purchase all the metal that is offered and coin it without limit and virtually without charge. This prevents the market price of gold from falling below the mint buying price. No one will sell gold at a lower price for nonmonetary uses when the monetary authority is a willing buyer at $20.67 an ounce.
3. Permit the melting of coins to get gold for nonmonetary uses. It is usually unnecessary to give permission to do this; people do it anyway if they find it the cheapest way to get gold. The effect of this is to prevent the market price of gold from rising above the mint price as long as gold can be acquired for nonmonetary uses by melting the full-bodied coins.

Figure 3–1 indicates that all this may be viewed as an arrangement whereby the price of gold is stabilized in terms of money. The curve S_TS_T represents the total supply of gold, in the sense of the total stock at various possible prices. The curve D_CD_C represents the demand function for gold for nonmonetary purposes. The chart indicates that the price of gold cannot fall below the level *OE* as long as the government stands ready to buy (represented by curve D_MD_M) at that price all that is offered for monetary purposes. And the price cannot rise above that level as long as gold can be supplied for nonmonetary uses by melting full-bodied gold coins. The supply of gold from melting coins is represented by the curve S_MS_M.

Another important point is this: When the government has fixed the price of gold and stands ready to buy in unlimited amounts and to permit melting of gold coins, it loses control of the quantity of full-bodied coins. The amount of gold in monetary use will be a residual equal to

the total gold stock minus the amounts demanded for nonmonetary uses. In our chart it is the total stock *OB* minus the amount absorbed in nonmonetary uses, *OA*. And the monetary value of the full-bodied coins is equal to the number of ounces in this form multiplied by the price per ounce. This is represented by the area *ADCB*.

Some consider it a merit of this type of money that its supply is limited by the cost of enlarging the gold stock and by competing demands for nonmonetary uses. They see this as a safeguard against overissue. Others see little merit in leaving the quantity of money in this form to be determined by the vagaries of gold mining and of competing demands.

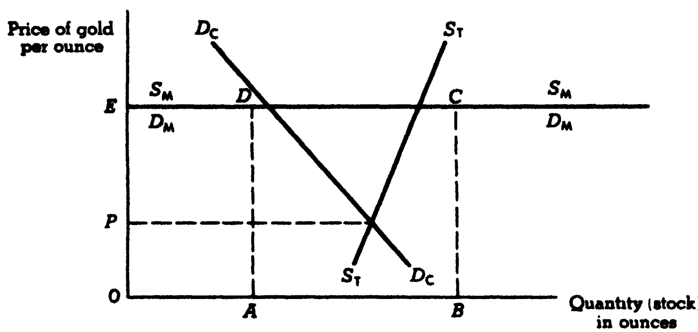


FIG. 3–1. Stabilization of the Price of Gold.

Two points on which there has been much misunderstanding need to be clarified:

1. To say that full-bodied coins have the same value as money as they have in nonmonetary uses of the metal is not to say that they have a constant value or purchasing power in terms of other things. If the price of a unit of gold is fixed in terms of money, its purchasing power varies reciprocally with the prices of other things. Thus, the purchasing power of gold will fall by half if the price level of other things doubles, and the purchasing power of gold will double if the price level falls by half. There is no reason to expect that the price level of other things will remain constant simply because the price of gold has been stabilized. For example, suppose that while many major countries stand ready to buy gold for monetary use at constant prices, someone discovers huge new gold deposits that can be mined and refined at very low real cost. One would suspect that the large increase in the supply of gold would in some sense lower its "value." Yet the price of gold cannot fall as long

as governments will buy it at constant prices for monetary purposes. How, then, may its "value" fall?

2. It is not true, as some have inferred, that the value of a full-bodied coin (in the sense of its purchasing power over other things) is simply the reflected value of the metal as determined by its total supply (stock) and its demand for nonmonetary uses. Its value is determined by the total supply (stock) of the material and by its total demand for monetary and for nonmonetary uses. And the monetary demand may come to be the major part of the total demand. If the monetary demand were withdrawn and the total supply made available for nonmonetary uses, the price and value of the material could fall greatly. For example, what would happen to the value or purchasing power of each ounce of gold if governments refused to buy any of the current gold output for monetary purposes? If, in addition, they threw onto the market the accumulated stock of about 1.2 billion ounces now held in monetary reserves?

Representative Full-Bodied Money

Representative full-bodied money, which is usually made of paper, is in effect a circulating warehouse receipt for full-bodied coins or their equivalent in bullion. The representative full-bodied money itself has no significant value as a commodity, but it "represents" in circulation an amount of metal with a commodity value equal to the value of the money. Thus, the "gold certificates" that circulated in the United States before their recall from circulation in 1933 represented fully equivalent amounts of gold coin or gold bullion held by the Treasury as "backing" for them.

In some respects, representative full-bodied money is similar to full-bodied money. The amount of it that can be issued depends upon the quantity of full-bodied money or its bullion equivalent available as "backing," and the cost of the "backing" material is as great as that of full-bodied money. This type of money has certain advantages over full-bodied money. In the first place, its use obviates the expense of coining, though against this must be set the cost of providing and maintaining the pieces of representative paper. In the second place, it avoids ordinary abrasion as well as the deliberate sweating, clipping, and chipping to which circulating coins are sometimes subjected. In the third place, it is easier to transport than the full-bodied money that it represents. This was certainly true of the Swedish representative money that circulated in place of massive copper coins during the seventeenth and eighteenth centuries, of the warehouse receipts for tobacco that circulated in Virginia and some of the other colonies, and of the pre-1933 gold

certificates. The principal disadvantages of this type of money as compared to full-bodied money are the ease of counterfeiting it if the representative paper money is not very distinctive, and its destructibility by fire.

Credit Money

By credit money, or debt money, we mean any money, except representative full-bodied money, that circulates at a value greater than the commodity value of the material from which it is made. In some cases, the market value of the money material is insignificant, as in the case of most paper money. In other cases, such as silver coins, the market value of the material may be substantial, but may still be below the value of the money.

How can a money achieve and maintain a value or purchasing power as money greater than the value of the commodity of which it is made? Essentially, the method is to limit the quantity of the money by preventing the free and unlimited transformation of the commodity into money. The most common way is for the issuing authority to fix the quantity of the particular type of money to be issued and to buy only as much of the money material as is needed for the purpose. The remainder of the supply of that commodity is left for nonmonetary uses, and this residual supply may be so large relative to demands for nonmonetary uses, that the market value of the commodity will fall far below the value of the money. For example, the value of paper money or copper coins as money can be maintained far above the market value of the paper or copper required to make them. Note that, in this case, the issuing authority itself determines the quantity of debt or credit money to be issued and the amount of the money material to be purchased for the purpose.

Credit or debt money can also result as the issuing authority buys all the money material offered to it, but at a price significantly below the monetary or face value of the money into which it is transformed. Suppose, for example, that the monetary authority issues pesos, each containing ½ ounce of silver, but stands ready to buy all silver offered to it at a price of only 1 peso an ounce. The issuing authority is clearly in a position to make large gross profits by purchasing silver at 1 peso an ounce and converting each ounce into 2 pesos of money. This gross profit to the issuer is called *seigniorage*. But the main point here is that this is a way of maintaining the value of credit money above the market value of the commodity of which it is made. Each ounce of silver in the form of money is obviously 2 pesos, but the price of silver in the market could

fall as low as 1 peso an ounce, the price at which the monetary authority will buy it.

Token Coins

As noted earlier, our coins (silver dollars, half-dollars, quarters, dimes, nickels, and pennies) are indeed the "small change" of our monetary system and make up only a very small fraction, less than 2 percent, of our total money supply. All these are token money, with a value as money considerably above the market values of the metals contained in them. In general, the government simply issues those amounts of the various denominations of coins that the public demands as "small change." The quantities of copper, nickel, tin, and zinc used in coins are so insignificant as compared with the total supply of these metals that the market prices of the metals would be little affected if all these coins were melted and sold. But if all the silver in our monetary system were withdrawn and sold, its market price might fall appreciably.

Representative Token Money

Representative token money, which is usually paper, is, in effect, a circulating warehouse receipt for token coins or for an equal weight of bullion that has been deposited with the government. It is like representative full-bodied money, except that the coin or bullion held as "backing" is worth less as a commodity than as money. Silver certificates are the only example of this type of money in the United States. These have been in circulation in varying amounts since 1878 and are "backed" by an equivalent number of silver dollars or by silver bullion of equivalent weight. Most economists see no advantage in having a paper money "backed" by silver with a commodity value far below its monetary value. They believe that the money function could be served fully as well by an equivalent amount of paper currency without specific backing. But silver producers, constantly on the alert for better markets for their product, often take a different view.

Circulating Promissory Notes Issued by Governments

Governments also issue credit money in a form that is usually, but sometimes inaccurately, called *circulating promissory notes*. These are usually made of paper and are sometimes called *fiat money*. Some of them carry the government's promise to redeem them in other types of money on demand; this is why this type of money is usually called circulating promissory notes. Others, however, lack this promise and in effect say, "This is a certain number of monetary units."

The only circulating promissory notes issued by the United States government and still in circulation are the United States notes, or "greenbacks," which were issued to assist in financing the Civil War. Over $400 million of them were originally issued, but they were reduced to $347 million by 1878 and have since remained at approximately that level.[1]

Many people oppose the use of government paper money, fearing that it will be issued in excessive amounts. Monetary history provides a real basis for this fear, since these issues provide an attractive source of revenue to governments. By spending a small amount for paper, engraving, and printing, a government can produce millions of dollars' worth of paper money, which can then be used to pay its debts or cover its expenses. The temptation to sacrifice proper monetary management to budgetary needs is often strong. It should be pointed out, however, that most of the excessive issues of paper money have occurred during war periods when nations felt that their very existence was at stake and when they were in dire need of more money to meet military requirements. There is no reason why a properly managed government paper money should not function well.

Circulating Promissory Notes Issued by Central Banks

A considerable part of the hand-to-hand currency that is used in most advanced countries is in the form of circulating promissory notes issued by central banks, such as our Federal Reserve Banks, the Bank of England, and the Bank of France. The largest part of our paper money is made up of Federal Reserve notes, which are circulating evidences of debt issued by the 12 Federal Reserve banks. In some cases, the paper money issued by central banks is redeemable in other types of money; in other cases it is irredeemable. Though the Federal Reserve banks will redeem their notes in token coins or other types of paper money, they are not obligated to redeem them in full-bodied money.

Circulating Promissory Notes Issued by Private Banks

Circulating promissory notes issued by privately owned banks have played an important role in monetary systems. Promissory notes issued by state-chartered banks and by the First and Second Banks of the United States provided a large part of the circulating medium in this country before the Civil War, and the national banks chartered by the

[1] The Treasury statements also list as outstanding $1 million of Treasury notes of 1890. Though these are government promissory notes, most of them are believed to have been destroyed, lost, or placed in collectors' boxes.

federal government issued such notes from the time of the Civil War until 1935, when their power of note issue was descinded. Though most of the notes issued by privately owned banks have been retired in this country, they are still used extensively in some other nations. These notes, it must be emphasized, are only circulating evidences of bank debts—creditor claims against banks.

Checking Deposits at Banks

The major part of the money supply in this country, as well as that in most other advanced countries, is in the form of demand deposits at banks. These so-called deposits are merely bank debts payable on demand, and are claims of creditors against a bank, which can be transferred from one person or firm to another by means of checks or other orders to pay. These claims against banks are generally acceptable in payment of debts and for goods and services. They are used almost exclusively in transactions involving large payments and very widely in small payments, such as those from customers to retailers and salaries and wages to employees.

The popularity of checking deposits can be traced to their advantages:

1. They are not so liable to loss or theft as other types of money.
2. They can be transported very cheaply, no matter how large the amount of the payment nor how great the distance from payer to payee.
3. Checks can be written for the exact amount of the payment, thereby obviating the necessity of making change and counting bills and coins.
4. When endorsed by the payee, checks serve as a convenient receipt for payment.

The principal disadvantage of checking deposits is that checks drawn on them may not be accepted from an unknown person, but this is largely remedied by such devices as certified checks, cashier's checks, and traveler's checks.

COMBINATIONS OF THE VARIOUS TYPES OF MONEY

The various types of money described in the preceding section have been used in actual monetary systems in many different combinations and proportions. At one extreme, the entire circulating medium is composed of full-bodied money or of full-bodied money plus representative full-bodied money. In such cases, the size of the total money supply depends on the official price of the money material and upon the quantity of that material the country can command for monetary uses. Many of the early monetary systems approached this type, but no such systems exist today.

At the other extreme, the entire circulating medium is made up of credit or debt money. Most modern monetary systems are of this type, with most of the money in the form of checking deposits and paper money. In some cases the monetary authorities make no attempt to keep the various types of credit money at a constant value in terms of any commodity, either directly or indirectly. These are pure credit money systems. In such systems, the size of the money supply is not determined by the availability of any metal or other money material or limited by any obligation to redeem in a money material. It depends solely upon decisions of monetary authorities. In other systems in which the entire circulating medium is composed of debt money, the authorities do attempt to keep the various types of money at a fixed value in terms of some commodity, directly or indirectly. We shall discuss these later.

In between are monetary systems combining full-bodied money, representative full-bodied money, and debt money in various proportions. In some, credit money has been only a very small fraction of the total; in others, it has been the major part. The general trend in monetary history has been for credit money to become increasingly large relative to full-bodied money. For example, even before western Europe and the United States ceased issuing full-bodied gold coins and gold certificates, it was not unusual for the total money supply to be four or five times as large as the value of a country's gold holdings.

As noted before, it has been common for a country to attempt to maintain its various types of credit money at a constant value in terms of some commodity, such as gold, and to do this by standing ready to redeem these moneys in the commodity. Some of the arrangements that have been used include the following:

Under *gold-coin standards*, all types of money are kept redeemable at par in full-bodied gold coins. Gold coins are available for circulation and the public is free to exchange other types of money for these coins, and vice versa. This system may succeed if the quantity of other money is very small relative to the supply of gold, but it may easily break down if the amount of credit money far exceeds the quantity of gold available.

Under *gold-bullion standards*, no gold coins circulate, but the monetary authority will sell gold in bullion form at a fixed price for money: It usually supplies gold bars with a value of not less than about $4000.

Under an *unlimited gold-bullion standard*, it sells gold in unlimited amounts to any person for any purpose. Even these systems may break down if the quantity of a country's money is far in excess of its gold supply.

Under a *limited gold-bullion standard*, it sells gold for only limited

purposes. The United States is on such a standard. The Treasury stands ready to buy all the gold offered to it, and to pay for it with other types of money, at a price of approximately $35 an ounce. It also sells gold at approximately $35 an ounce, but only with strict limitations. It supplies gold domestically for legitimate industrial, professional, and artistic uses. It also sells gold to foreign central banks and governments for the purpose of preventing depreciation of the dollar in terms of foreign moneys that have fixed values in gold. But our moneys are not convertible into gold domestically. The principal monetary role of gold is in international payments, not domestic.

Under *gold-exchange standards*, a country's money is not redeemable directly into gold in any form, but is redeemable in some foreign money, which in turn is in some sense fixed in terms of gold. But this redeemability is for international, not domestic, use.

Historically, then, we find two important trends:

1. The quantity of credit money has contributed an increasing part of the total circulating medium and is an increasing multiple of the supply of monetary gold.
2. The redeemability of other money in gold has become increasingly attenuated. The trend has been from gold-coin standards to unlimited gold-bullion standards to limited gold-bullion standards or gold-exchange standards. Most modern systems are of the latter two types. These two trends are not related.

As soon as the quantity of money becomes a multiple of a country's monetary gold, a promise to redeem all money in gold becomes a promise that cannot be kept if demands for redemption are actually made in volume. And there is often danger that such demands will be made. For example, a country may overexpand its total money supply, increase its costs and prices relative to those of other countries, and lose much of its gold to other countries to pay for an excess of imports over exports. Or some event may create fears that a country will be unable to redeem its money in gold, which will lead to large demands for redemption. For these and other reasons, countries have often been forced to suspend free redemption of their moneys in gold. In some cases in which they could have continued to redeem all money in gold, they have been unwilling to do so because that would have required what they considered to be an undesirable restriction of the total money supply. They wanted more freedom to issue money to promote output and employment, to finance government deficits, or for other purposes.

Reasons such as these help to explain the historical trend for governments to limit ever more narrowly, and even to discontinue, the redeemability of money into gold or any other valuable commodity. And as gov-

ernments limit their liability to redeem in gold, they achieve freedom to allow the money supply to become larger relative to the amount of monetary gold.

THE GENERAL ACCEPTABILITY OF MONEY

Though many countries, including the United States, have long used credit money and this credit money has often not been redeemable in gold, silver, or any other money with a substantial nonmonetary value, the feeling still persists in some quarters that pieces of money cannot be "good" or even generally acceptable unless they themselves have an equivalent value for nonmonetary purposes or are kept redeemable in other types of money that have an equivalent value for nonmonetary uses. At the risk of excessive repetition, we must point out again that this view is erroneous. That token coins, paper money, and other circulating debts can be overissued, and on too many occasions have been, is undeniable. But if their issue is properly limited, they can be given a scarcity value and can circulate at least as satisfactorily as any full-bodied money; in fact, with proper management, their quantities can be adjusted to the needs of the economy better than can the quantities of a gold or silver full-bodied money whose supply often reflects the capriciousness of gold or silver mining.

Money can have a value simply because it is limited in supply and is demanded for use as money. Barter, as we have seen, is inconvenient. To escape these inconveniences, people want some kind of "tokens" or "tickets" that can be used as means of payment. In determining whether or not to accept such tickets in payment of debt or for goods and services, each person is interested in only one question: "Can I pass them along to someone else in exchange and without loss of value for the things I want to buy?" He is interested in their acceptability as money, not in their usability for some other purpose.

To describe how all this came about, we shall sketch some of the major forces that have strongly influenced the development of money and monetary institutions. As monetary history our discussion will not be complete, but the purpose is rather to concentrate on major forces and motivations.

Coinage

Let us start with the use of uncoined metals, such as copper, gold, and silver, as circulating media. These metals probably came to be generally acceptable in payment because they were widely desired for religious

and ornamental purposes, they did not deteriorate, their large value relative to their weight and bulk made them relatively easy to transport, and so on. At this stage, money was not differentiated from the material of which it was made; the metals flowed freely into and out of monetary uses. The use of bullion as money had serious disadvantages, however, especially if payors were not averse to short-weighting and adulteration. Precision weighing apparatus was not widely available and assaying was both laborious and inaccurate. Coinage solved both these problems. At first, coinage amounted merely to an official certification as to the weight and purity of a lump of metal. The imprint of a king's stamp meant in effect, "I hereby certify that this contains a certain weight of metal of a certain purity." The names of many monetary units (such as pounds, lire, livres, and shekels), which were originally units of weight, attest to this fact.

Coinage was an important monetary innovation. It greatly expanded the use of metallic substances as money. More important, however, it was a long step toward the differentiation of money from its component material. Not metal, but *coined metal*, became money. People gradually ceased to think in terms of the *weights* of metal; they thought in terms of the *number of coins*—not the weight of silver in a payment, but the number of shekels or lire. Debts and other contracts came to be stated in monetary units. This habit often persisted after the pure metallic content of the coins was reduced through abrasion, clipping, sweating, or deliberate action of the sovereign. When coinage was limited, the value of the coins as money often rose above the commodity value of their reduced metallic content; token coins appeared.

The Evolution of Banking

Despite their other advantages, full-bodied gold or silver coins had some disadvantages for those who held them or used them to make payments:

1. *Danger of theft and robbery.* Safekeeping may have been easy for a king with an armed entourage or a wealthy businessman with strong vaults, but it could be a serious problem for others, especially when law enforcement left much to be desired.

2. *Cost and risk of transporting to make payments over distances.* Transport costs alone were high; even more onerous in many cases were risks of robbery. The bad guys who held up stage coaches, now so frequently portrayed in TV westerns, were by no means the first brigands to take their toll on roadways, and bad guys in ships were problems in

many seas. Nor were the cattle barons the first members of nobility to encourage their men to pick up a little money on the side.

3. *Loss of weight of the coins through abrasion, clipping, chipping, and sweating.* The payor lost nothing as long as the coins were acceptable at face value. But after coins had reached some stage of deterioration, payees might accept them only by weight, with losses to the payor.

4. *Absence of interest or any other return on the money.* People began to look for ways to overcome these disadvantages.

Largely because of the danger of theft and robbery, the practice arose of leaving gold and silver in the custody of some reputable person (a wealthy merchant, a money changer, or a goldsmith) who owned a strong box or other means of safekeeping. At this stage, the "depositor" undoubtedly expected that the custodian would indeed hold all the specie intact. The custodian performed this service as a favor for his friends or made a charge for it. It is also probable that at this initial stage, a depositor who wished to make payments would himself go to the goldsmith or other custodian, get the required amount of coins, and use the coins themselves to make payment. But this was inconvenient; how much easier it would be to transfer claims against the metal. And such claims were at hand, for the goldsmith or other custodian usually gave some sort of evidence to the depositor. One type was a receipt, which said in effect, "IOU so many florins." The next step was for payors to make payment by giving these IOUs to a payee. The latter could then claim the specie from the goldsmith, or use the IOU to make payments to others. As these IOUs came to be used in payments, the bank note was born. A bank note is simply a bank debt or promise to pay, evidenced by a piece of paper. The earliest bank notes may have been acceptable only because they were believed to be fully backed by specie. Nevertheless, this was an important step in the evolution of money, for the community was becoming accustomed to using in payment not the precious metals themselves but paper claims against those metals.

Another method of payment soon developed. The person leaving gold and silver with the "banker" would not receive a piece of paper representing the debt of the banker, but simply a "deposit credit" evidenced by an entry on the bank's books. The practice soon arose of making payments by writing an order on the banker to pay someone else. For example, Jones would write an order on the bank saying, "Pay Smith X florins and charge to my account." Smith might then claim the gold or silver. But as such orders became more widely acceptable in payment, it became increasingly common for payees to leave the specie with the goldsmith or other banker and to pay others by transferring claims to

deposits. Thus, deposit claims, not specie itself, came to be used as a means of payment.

The high cost and risk of transporting precious metals over distances created an opportunity for profit that did not go unnoticed by shrewd goldsmiths and merchants. One can imagine a canny goldsmith-banker in Lübeck writing to his counterpart in Genoa:

> As we both know, trade between our areas has grown rapidly in recent years. Large amounts of specie flow every month from my area to yours, at great cost to the merchants and great risk to property and life. At the same time, almost equally large amounts of specie flow from the Genoa area to the Lübeck area, at comparable cost and risk. We can easily abolish these unnecessary costs, spur the development of trade, and add to our own pitifully low incomes by cooperating with each other. When someone in your area wishes to make a payment in the Lübeck region, you get from him the required amount of specie and give him an order on me to give specie to the payee, and I will do so. Then, when someone in my area wishes to make payments in the Genoa region, I will collect from him the required amount of specie and give him an order on you, which I hope you will honor. We will have to ship specie between Lübeck and Genoa only to the extent that the payments I make for your account and the payments you make for my account do not balance out, and I forecast that the net shipments required will be very small indeed relative to the total payments effected by us. In fairness to our customers and in the interest of promoting our business we should not charge for these services as much as it would cost our customers to ship specie equal to the total value of all payments, but in fairness to ourselves and our families our charges should exceed our actual costs.

Such were the motivations that led to the establishment of business relationships among emerging "bankers" in the leading commercial centers. Bills of exchange or orders to pay became an increasingly popular way of effecting payments, and the things transferred were claims against goldsmith-bankers or merchant-bankers.

Up to this point, we have dealt with only two forces toward the evolution of banking: the disadvantages of full-bodied coins because of their liability to theft and robbery and the high cost and risk of transporting them. But these two forces alone were sufficient to concentrate large amounts of the precious metals in the hands of an emerging class of "bankers." At first these were primarily goldsmiths, moneychangers, or merchants who took on safekeeping of specie and related functions as a side line. Gradually, however, these functions rose in relative importance and profitability, and specialized bankers began to emerge. Note that in this earliest stage, all "deposits" and "bank notes" were fully backed by specie, and the income of the emerging bankers came from charges for safekeeping and for transmitting payments.

Then came a discovery that was to be momentous for the evolution of

banking. The emerging bankers discovered that, to meet their promises to pay in specie on demand, they did not need to hold gold and silver equal to 100 percent of their outstanding debts in the form of deposits and bank notes. A banker who was in fact holding specie fully equal to the value of his deposit and bank-note liabilities might have put it this way:

> I do not need to hold all that specie because those people are not all going to demand payment at any one time or even over a short period. Of course, there will be withdrawals. Some will want gold or silver for circulation. Also, I must be prepared to pay gold or silver to other banks who acquire claims against me in the form of deposit and bank note claims that I have issued. But such outpayments will be largely balanced by new inflows of gold and silver. I could meet any net drain that is likely to occur if I held gold and silver equal to only a small fraction —perhaps only a tenth—of my outstanding note and deposit liabilities. To hold more is terribly wasteful. Look at all the gold and silver lying there, idle and earning nothing! I think I'll lend out some of it and earn some interest.

And if his conscience was troubled by his contemplated breach of trust, he may have soothed it by replying, "I didn't promise my customers in so many words that I would hold all the gold and silver; I merely promised that I would pay them gold and silver when they asked for it. If I keep the promise why should it be any concern of theirs if I increase my income a little?"

So were banks transformed from mere custodians holding specie reserves equal to 100 percent of their deposit and bank-note liabilities into lenders who held specie equal to only a fraction of their liabilities. Fractional-reserve banking was born. Such banking may indeed have originated as a surreptitious breach of trust. But the secret was soon out, and fractional-reserve banking gained widespread support. A banker could now say in effect to the public:

> It will be to our mutual advantage if you leave most of your gold and silver with me and hold and use as money the bank notes and deposits. The advantage to me as a banker is obvious; I can make loans and earn an income. But I will share this with you by providing valuable services at little or no cost to you. If you want currency that is convenient to hold or transport, I will provide you with bank notes. If you want the convenience of checking facilities I will provide those too. I will hold your funds in safekeeping, provide you with checkbooks, make payments for you over long distances, and do much of your bookkeeping for you.

Many banks also paid interest on deposit balances, an advantage not carried by coins. Moreover, those who were depositors often received preferred treatment when they applied for loans.

In these various ways, the public was persuaded to hold more and

more of its money in the form of bank notes and deposit claims against banks. Increasing proportions of the gold and silver money came to lodge in the banks, there to serve as a fractional reserve against the banks' note and deposit liabilities.

The fractional-reserve principle gave banks another great power that will be emphasized in later chapters—the power to increase and decrease the total money supply. Banks did not have this power when they issued bank notes and deposits only in exchange for an equal value of gold and silver; they merely substituted in the hands of the public one type of money for another. Suppose, for example, that the public has entrusted \$100 of gold and silver to the banks in exchange for bank notes and deposits. This will appear as follows on the balance sheets of the public and the banks:

Balance Sheet of the Public		Balance Sheet of the Bank	
Assets	**Liabilities**	**Assets**	**Liabilities**
Gold and silver − \$100		Gold and silver + \$100	Note and deposit liabilities + \$100
Bank notes and deposits + \$100			

The public's total holdings of money remain unchanged, its larger holdings of bank notes and deposits being offset by its smaller holdings of gold and silver. And the banks have issued note and deposit liabilities equal to only the \$100 of gold and silver surrendered by the public.

Suppose now that, starting from this situation in which both their gold and silver holdings and their note and deposit liabilities are \$100, the banks decide they can meet any likely demands for payments if they hold gold and silver reserves equal to only 10 percent of their liabilities. They come to believe that any gold and silver holdings in excess of 10 percent of their liabilities can be used as a basis for lending. Consider two extreme cases:

1. As the banks lend, the borrowers withdraw from the banks' gold and silver equal to the full amount of the loans. If the banks lend \$90, their holdings of gold and silver will fall by that amount, and they will increase their assets in the form of outstanding loans (debt claims against borrowers) by the same amount. The banks' balance sheets will now appear as follows:

Assets		Liabilities	
Gold and silver	\$10	Note and deposit liabilities	\$100
Loans	90		

The effect of this transaction is to increase the public's money supply by \$90, the amount of the increase in loans. The public still holds its \$100 of notes and deposits, and borrowers now have, in addition, the \$90 of gold and silver paid out by the banks. Thus, we find that by making loans or buying other assets, the banks can increase the public's money supply even if borrowers take all their loan proceeds in gold and silver.

However, once the public has become accustomed to using bank notes and deposits as money, borrowers are unlikely to withdraw gold and silver equal to the full amount of their borrowings. They are likely to accept bank notes or deposits instead. Let us therefore consider the other extreme case.

2. As the banks lend, the borrowers take all the loan proceeds in the form of bank notes and deposits, and there is no net drain of gold and silver from the banks. Suppose the banks lend \$900, giving note or deposit claims to the borrowers. The balance sheet of the banks will appear as follows:

Assets		Liabilities	
Gold and silver	\$100	Note and deposit liabilities	\$1000
Loans	900		

In this process, the banks have increased the public's money supply by \$900, and have done so by issuing new note and deposit liabilities in exchange for debt claims against borrowers. The banks feel secure because their gold and silver reserves are still equal to 10 percent of their liabilities. In a sense, each \$1.00 of gold and silver is supporting, or serving as a basis for, \$10.00 of note and deposit liabilities. But most of these notes and deposits were created as banks purchased assets other than money itself. We shall later analyze these processes in more detail and also the process through which banks decrease the total money supply by decreasing their holdings of loans and other debt claims. But have a try at explaining this yourself. What would happen to the money supply if, starting from the last situation described above, the banks decreased by \$500 their outstanding loans?

In broad outline, such are the processes through which the public came to hold much of its money in the form of claims against banks. Even when full-bodied gold and silver coins were available and the public could have refused to accept or hold anything else, it chose to hold much of its money in the form of bank notes and deposits, and the banks found it profitable to manufacture these claims. Thus, in large part, the development of credit or debt moneys reflected private choices—the

public's choices among the various types of money and the choices of bankers as lenders and creators of money.

Government and Credit Money

Though the composition of the money supply and the trend toward greater use of credit moneys have been greatly influenced by the choices of the public and the bankers, governments have exerted important influences in many ways. We shall mention here only a few of the most important.

1. Governments themselves have been issuers of credit money. In some cases, the purpose has been to provide more convenient types of money, such as token coins or paper money; in others, it has been to remedy an alleged shortage of money; and in still others, it has been to finance government expenditures.

2. Governments influence the establishment and operation of banks in various ways. For example, they have both encouraged the establishment of banks and regulated their operations. At an early stage, they encouraged the issue of bank notes; later they moved toward the abolition of bank notes. And in various ways they regulate the volume of bank deposits.

3. They regulate the availability of full-bodied and representative full-bodied moneys and the redeemability of moneys in precious metals. For example, most European countries discontinued gold-coin standards and moved toward some sort of gold-bullion standards after World War I, and the United States followed suit in 1933. As noted earlier, the trend has been toward more and more restricted redeemability in gold, thus encouraging the expansion and use of credit moneys.

Most of these points will be developed further in later chapters.

THE MONEY SUPPLY OF THE UNITED STATES

A few facts about the American monetary system as it had developed by the 1960s will serve as an introduction to more detailed descriptions in the subsequent chapters.

1. All our money is debt or credit money. We have had no full-bodied money or representative full-bodied money since 1933, when gold coins and gold certificates were withdrawn and discontinued.

2. Checking deposits make up more than three-quarters of the money supply, paper money about one-fifth, and coins only about 2 percent. All these types of money, except checking deposits, have full legal-tender powers. That is, they have the legal power to discharge debts; creditors

may not insist on payments in any other type of money if the debt is stated in dollars. Though checking deposits are not themselves legal tender, the banks are obligated to redeem them on demand in legal-tender money. This lack of legal-tender power reduces the general acceptability of demand deposits only in periods when people doubt the banks' ability to pay their debts.

3. This distribution of the money supply among coin, paper money, and checking deposits reflects the preferences of the public. The Treasury and the Federal Reserve do indeed regulate the size of the total money supply, and the government determines the specific types of coins and paper money to be made available. But the public itself determines the proportions in which it will hold the various types of money. This is because all types of money are exchangeable for each other on a dollar-for-dollar basis. The Treasury and the Federal Reserve stand ready to exchange all types of coin and paper money for each other at par. The commercial banks are legally required to pay checking deposits at par in coin and paper money, and for reasons of profit, banks will always issue checking deposits in exchange for coin and paper money.

4. There are three types of monetary institutions, or issuers of money, in the United States: the Treasury, the Federal Reserve, and the commercial banks. Treasury issues, called *Treasury currency* are the smallest, making up less than 4 percent of the money supply. The Treasury has a monopoly of coinage and also issues a minor fraction of our paper money. The Federal Reserve issues Federal Reserve notes, which constitute most of our paper money and about 20 percent of the total money supply. By far the largest issuers of money are some 13,500 commercial banks, which issue checking deposits. These are privately owned, privately operated, profit-seeking institutions. We shall see later that one of the major functions of the Federal Reserve is to regulate money creation and money destruction by these institutions.

5. Treasury currency, already constituting the smallest share of the total money supply, is likely to become an even smaller share in the future. Coins will almost certainly increase as the economy expands and the needs for "small change" rise. But the absolute amount of Treasury paper money will decrease. The volume of United States notes (greenbacks) will probably remain unchanged. The total amount of them in existence has remained approximately constant (about $347 million) since the end of the Civil War, and any proposal either to increase or decrease their quantity would probably arouse controversies reminiscent of the late nineteenth century. Table 3–2 lists $170 million of other paper money in process of retirement. In fact, most of these vestiges of

earlier issues are probably not in circulation but have been lost, destroyed, or become collectors' items. Silver certificates, listed in Table 3-2 in the amount of $1827 million, began to be retired in 1961. Each dollar of these certificates is "backed" by 371¼ grains of pure silver held by the Treasury.

TABLE 3-2. The United States Money Supply and Its Issuers, March 31, 1963

Issuer	Type of Money (amounts in millions)	Amount Outstanding	Percent of total
United States Treasury	Coins	$ 2,796	2.0
	Paper money		
	Silver certificates	1,827	1.2
	U.S. notes	313	0.2
	Other in process of retirement	170	0.1
Federal Reserve	Paper money		
	Federal Reserve notes	29,408	19.6
Commercial banks	Checking deposits	115,400	76.9
Totals		$149,914	
Addendum:	Coins	$ 2,796	2.0
	Paper money	31,718	21.1
	Checking deposits	115,400	76.9
	Total	$149,914	100.0

SOURCE: *Federal Reserve Bulletin*, May, 1963, pp. 659–661. The figures for coin and paper money show amounts outside the Treasury and the Federal Reserve banks. They therefore overstate the amounts in actual circulation by the quantities held in commercial banks and in other countries.

The existence of silver certificates attests to the political power of silver-producing groups, sometimes allied with opponents of deflation, and to the success of their demands on several occasions that the government "do something for silver" by purchasing the metal and using it as backing for silver certificates. Relatively small amounts were purchased for this purpose in 1878 and 1890. Most of it was purchased during and following 1933. Very large purchases of existing silver stocks, both in this country and abroad, were made within a few years after 1933. Silver-producing groups also secured the passage of laws requiring the Treasury to purchase at a fixed price all newly mined domestic silver. The price was increased from time to time, but from 1946 to 1963 it was 90.5 cents per ounce. This price was considerably above the market price during the early part of the period, so that practically all newly mined domestic silver was sold to the Treasury, which paid for it by creating and issuing silver certificates. Later, however, demands for silver for nonmonetary purposes increased so greatly relative to supplies as to raise the market price appreciably above the Treasury's buying price. Almost no silver

was offered to the Treasury after 1959, and in early 1963 the market price rose at times to more than $1.28 per ounce.

With the market price so far above the Treasury's buying price, and expected to stay there, it became politically feasible to repeal the silver purchase Acts. Legislation enacted in 1963 contained the following provisions:

1. It relieved the Treasury of its obligation to buy newly mined domestic silver.

2. It permitted the Treasury to retire silver certificates and to use the silver so released for coinage or for sales to other government agencies. The Treasury may not sell silver for other purposes at a price below the cost of obtaining silver by melting silver dollars (slightly more than $1.2929 per ounce). Officials forecast that only about $35 to $40 million of silver certificates will be retired each year. Retirements may be faster, however, if continuing increases in nonmonetary demands for silver raise the market price to more than $1.2929 per ounce.

3. It authorized the issue of Federal Reserve notes in $1.00 and $2.00 denominations to replace silver certificates. The Federal Reserve had previously been forbidden to issue its notes in denominations below $5.00.

4. It repealed the 50 percent tax on profits made in silver sales, thereby permitting the re-establishment of a free silver market in the United States.

In short, it now appears that Treasury currency will in the future make up an even smaller part of the total money supply. Though fractional coins will undoubtedly increase in absolute amounts, Treasury paper money will decrease. Federal Reserve notes will have to expand to replace retired Treasury issues and to meet increased needs for paper money. However, one cannot be sure that there will never again be successful demands that the government "do something for silver."

II. Commercial Banking

4. The Commercial-Banking System

In the preceding chapter, we identified the three sets of monetary institutions in the United States: the Treasury, the Federal Reserve, and the commercial banks. All of these will be analyzed before we are through. It will be convenient to start with commercial banks, whose debts in the form of demand deposits make up about three-quarters of our money supply and whose operations account directly for the major part of fluctuations of the money supply through time. However, we should remember that the functioning of commercial banks is closely intertwined with that of the Treasury and the Federal Reserve, especially the latter. The nature of these interrelationships will become clear as we go along.

COMPOSITION OF THE AMERICAN COMMERCIAL-BANKING SYSTEM

Our commercial-banking system is made up of nearly 13,500 commercial-banking corporations. These differ in many respects. In size, they range all the way from the huge Bank of America with assets considerably in excess of $10 billion down to little banks with assets below $1 million. About 85 percent are "unit banks," each operating only a single banking office. Nearly 15 percent are "branch banks," operating a total of more than 12,000 branches or offices in addition to their headoffices. About 4500 are called *national* banks because they operate under charters granted by the federal government. Nearly 9000 operate under charters granted by the various states. All the national banks and about 1500 of the state-chartered banks are members of the Federal Reserve System.

They hold about 85 percent of all commercial-bank assets. The other 7400 state-chartered banks, usually called *nonmember banks*, are not members of the Federal Reserve. However, all but 300 of them have their deposits insured by the Federal Deposit Insurance Corporation and are subject to examination and supervision by that institution.[1] Banks also differ in the types and proportions of securities held, and in many other ways. Despite these differences, all commercial banks have enough in common to justify our dealing with them collectively as a "system." They all create and destroy money and do so in the same general ways.

In the remainder of this chapter we shall deal with the commercial-banking system as a whole, largely ignoring relationships among the individual banks and concentrating on the relationships of the commercial banks as a whole with other members of the community. We do this because we are interested here in what the commercial banks do as a group, not in which particular bank does it. As a result, we shall make a number of statements about the commercial-banking system as a whole that may not be valid if applied to an individual bank. Interrelations among these banks will be discussed later.

SOME PROBLEMS OF NOMENCLATURE

Though these institutions have long been called *commercial* banks, the name is not accurately descriptive and may be misleading. In the first place, it does not indicate accurately the scope of their lending. The name was originally applied because of a belief that they should make only short-term "commercial" loans. Such loans were not more than a year in length and were made to traders and merchants, to finance the transportation of goods in domestic and international trade and to finance the holding of inventories during the relatively short periods required for their sale. As industry developed, this theory was modified to admit the propriety of short-term lending to producers, to meet payrolls, finance inventory, and meet other needs for circulating capital. Commercial banks today do indeed make such short-term commercial and industrial loans; in fact, they are by far the largest lenders in this market. But they have never confined themselves to such loans, and today they make loans of almost every type: loans on real estate, loans to consumers, loans for purchasing and carrying securities, loans to governments, and many others. They even make some extended long-term loans, though these are usually kept to a small part of their total portfolios.

In the second place, the name "commercial bank" may obscure the

[1] These numbers refer to the situation in mid-1963.

fact that these institutions perform not just one but many types of functions. Most of them are department-store banks, not specialty shops. They not only issue and transfer checking deposits, but also operate savings departments, which issue time and savings deposits in competition with savings banks and other similar financial institutions. They also operate trust departments, act as agents for their customers in buying and selling securities, underwrite and sell new security issues for state and local governments, sell insurance, and so on.

In the third place, the name fails to bring out the one unique characteristic of these institutions. They are differentiated from other institutions, not primarily by the types of loans they make but by the fact that, among all private financial institutions, they are the only ones whose debts circulate as money and who have the power to create and destroy money. In their early decades they issued money in the form of both bank notes (their debts evidenced by circulating pieces of paper) and checking deposits. Though they have lost the right of note issue, they still create and issue money in the form of checking deposits.

For such reasons, we should prefer to call these institutions *checking-deposit banks*, or some other name that would highlight their uniqueness among private financial institutions. However, we shall bow to popular usage and call them commercial banks. In the succeeding pages, we shall concentrate our attention on the checking-deposit function, largely ignoring most of the other functions performed by these department-store institutions. But we shall have to pay some attention to the activities of these banks in creating time and savings deposits.

BALANCE-SHEET ACCOUNTING

A short discussion of some elementary principles of double-entry accounting will not only illuminate the processes through which the commercial banks issue and withdraw their debts that serve as money but will also prove useful later when we discuss the operations of the Treasury, the Federal Reserve, and other institutions.

In drawing up financial statements for any unit, be it a business firm, a government, or any other organization, an accountant considers the unit to be an entity, separate and distinct from its owners. The entity must therefore account to its owners as well as to other claimants against it. There are two principal types of financial statements. One is the *income statement* or *profit and loss statement*. Such statements summarize, for some stated period of time, all the gross income accruing to the entity and the claims against that gross income—claims of owners as

well as others. We shall not use income statements at this point, though we shall later refer back to them.

In contrast to income statements, which refer to flows over a stated period of time, the *balance sheet* refers to a stock at a point in time. One side of the balance sheet, the *assets* side, lists the types and values of everything owned by the entity. These things of value may be money itself, debt claims against others, shares of ownership in other firms, inventories, plant and equipment, and so on. The other side of the balance sheet, *liabilities and capital account*, lists the types and amounts of claims against the entity's assets. Since double-entry accounting requires that the entity account for the total value of its assets, no more and no less, the total value of claims against assets must be exactly equal to the value of its assets. Any value of assets in excess of other claims against them accrues to the owners. Liabilities are all claims against assets other than ownership claims. Under the law they have priority over ownership claims. They are mostly debt claims of some sort; they may be evidenced by formal documents such as promissory notes or bills of exchange, or they may be evidenced only by book entries. *Capital account*, or *net worth*, is simply the value of ownership claims against the entity. Since owners have only a residual claim, capital account or net worth is equal to the value of assets minus liabilities.

A highly simplified balance sheet might appear as follows:

Assets		Liabilities and Capital Account	
		Liabilities	\$ 85,000
		Capital Account	15,000
Total	\$100,000	Total	\$100,000

This necessary equality of assets with the sum of liabilities and capital account permits us to write three simple equations that will be useful:

(1) Assets = liabilities + capital account
(2) Capital account = assets − liabilities
(3) Liabilities = assets − capital account

People are sometimes amazed at the accuracy of accountants, noting that no matter how complex the situation or how great the amounts involved, the accountant still manages to make the two sides balance. This becomes less remarkable when we realize how the value of net worth was arrived at.

For most of our purposes it will be sufficient to deal with capital account as a lump sum without further breakdown. However, it is per-

haps worth noting that the $15,000 net worth in our example might have been broken down somewhat as follows:

Total net worth	$15,000
Capital (10,000 shares of stock at a par value of $1.00)	10,000
Surplus	5,000

Capital, or *capital stock*, is the value of ownership claims evidenced by the par or stated value of outstanding shares of stock. *Surplus* is simply the excess of total ownership claims over the par value of outstanding stock. Any other interpretation may be misleading. In some cases, surplus is broken down still further. Thus, the $5000 in the preceding breakdown could be shown as

Surplus	$3000
Undivided profits	2000

The latter entry suggests that owners have a claim for dividends which will be paid in the near future. This may not occur; firms often carry such an item on their balance sheets for years. Undivided profits are best viewed as only a part of ownership claims.

Since we shall be deeply interested in the behavior of the liabilities of banks in the form of deposits, and especially demand or checking deposits, it will be useful to divide bank liabilities, or debts, into three parts: demand deposits, time and savings deposits, and other liabilities. Thus, we can rewrite as follows our simple equations:

(1) Assets = demand deposits + time and savings deposits + other liabilities + capital accounts

(2) Demand deposits = assets − time and savings deposit − other liabilities − capital accounts

In analyzing the functioning of monetary institutions, we shall emphasize one aspect of the necessary equality of assets and the sum of outstanding claims in the form of liabilities and net worth, namely, that a firm can acquire assets only by creating an equal value of claims against itself. Of course it may change the composition of its assets without changing at all the other side of its balance sheet. For example, it may trade some of its short-term claims against others for long-term claims against others; and so on. Such exchanges of assets may not disturb either the total value or the composition of outstanding claims against the entity. But it can make net additions to its assets only by creating an equal value of claims against itself. And in the process of reducing its total assets, it must withdraw and retire an equal value of claims against itself.

As we proceed, we shall repeatedly find it useful to recall these simple facts:

1. When these monetary institutions make net additions to their assets, they must pay for them by creating and issuing an equal value of claims against themselves.
2. When they make net sales or net reductions in their assets, they must withdraw and retire an equal value of claims against themselves.

A BALANCE SHEET FOR THE COMMERCIAL-BANKING SYSTEM

Table 4–1 is a simplified consolidated balance sheet for the commercial-banking system. It is simplified in the sense that it eliminates or lumps together some minor items in order to concentrate attention on major variables. It is consolidated to eliminate claims of the various commercial banks against each other, leaving only the claims of the commercial banks as a whole against other members of the community, and the claims of other members of the community against commercial banks.

TABLE 4–1. Consolidated Balance Sheet for the Commercial-Banking System, December 28, 1962 (amounts in billions)

ASSETS			LIABILITIES AND CAPITAL ACCOUNTS		
	Amount	Percent of Total		Amount	Percent of Total
Cash in vault	$ 4.3	1.7	Demand deposits	$131.1	50.9
Deposits at Federal Reserve	17.7	6.9	Time and savings deposits	97.8	37.9
Loans	140.1	54.3	Other liabilities (net)	4.8	1.9
Securities	95.7	37.1	Capital accounts	24.1	9.3
Total	$257.8	100.0	Total	$257.8	100.0

SOURCE: *Federal Reserve Bulletin*, May, 1963, pp. 666–667.

This balance sheet brings out several important points, some of which relate to the nature and proportions of the claims issued by banks. One point is that banks have acquired only a very small part, less than 10 percent, of their total assets by issuing net worth or capital account claims. An even more important point is that the volume of capital account claims changes only slowly and within narrow limits relative to bank assets. "Other liabilities," such as bank borrowings from the Federal Reserve, are also rather small relative to total assets. Most of

the assets of banks were acquired by creating and issuing bank debts in the form of deposit claims. Moreover, when banks acquire additional assets, they pay largely by creating additional deposit claims against themselves. And when they make net sales of assets, they collect largely by withdrawing and retiring deposit claims against themselves.

Other points relate to the nature and composition of bank assets. It should be emphasized that banks could, if regulations and business prudence permitted, create or withdraw deposit claims by purchasing or selling assets of any kind. One can even imagine their doing this by buying or selling common stocks, real estate, or double-jointed goobers. However, a look at the asset side reveals that, in practice, they restrict their holdings largely to cash, deposits at the Federal Reserve banks, and debt claims against others, mostly the latter. Assets in the form of cash and deposit claims against the Federal Reserve yield no interest and are held largely to meet legal reserve requirements. Loans and securities do yield interest and make up the major part of total bank assets. Loans include the banks' holdings of debt claims against their borrowers, these being evidenced by acceptances and promissory notes, mostly the latter. The item "securities," sometimes called *investments*, includes a small amount of stock, such as stock in the Federal Reserve banks, but it is composed largely of longer-term debt instruments purchased and held by the banks. It includes debt obligations of the federal government, debts of state and local government, corporation bonds, home mortgages. farm mortgages, and so on.

As we realize that banks create their own deposit debts primarily by purchasing debt claims against others, we begin to see why these institutions are often referred to as "dealers in debt" and "monetizers of debt."

THE CREATION OF CHECKING DEPOSITS

Let us start with the simple case in which banks issue and withdraw claims only in the form of demand deposits. The purpose of this will be to illustrate how commercial banks would operate if they were not in the business of issuing time and savings deposits as well. The latter will be reintroduced at a later point.

Deposits for Cash

The first case to be considered is that in which banks issue deposits in exchange for a net inflow of cash into the banking system. We shall use the term *cash* to include both cash in vault and deposit claims against

the Federal Reserve banks. This is justified because banks are free to exchange one of these assets for the other. Thus, they may use a net inflow of coin and paper money from circulation to increase their cash in vault or they may send it along to the Federal Reserve banks to increase their deposits there. Moreover, they can ship cash from their vaults to increase their deposits at the Federal Reserve, and they can write checks on their deposits at the Federal Reserve to get coin and paper money to hold in their vaults. The amount of "cash," in this sense, in the commercial-banking system is equal to all the "money" issued by the Treasury and the Federal Reserve minus that in circulation outside the banking system. Thus, a net inflow of cash to the banking system can result either from new issues of money by the Treasury or the Federal Reserve, or from a net decrease of coin and paper money outside the banks.

Suppose there is a net cash inflow of $1 billion into the commercial-banking system. The direct effect on the banks' balance sheets will be as follows:

Assets	Liabilities
Cash + $1 billion	Demand deposits + $1 billion

The banks have bought $1 billion of assets in the form of cash by creating their own debt of $1 billion in the form of demand deposits.

It was perhaps injudicious to begin with this case, for it may reinforce popular misconceptions. The reactions of some may be, "Just as I thought! Deposits are nothing but claims on deposited cash; they arise only from the "deposit" of cash, and anyone leaving cash on deposit can get back that same cash on demand." Such conclusions would be quite wrong.

1. Only a small part of outstanding deposits was created to pay for net inflows of cash; most deposits were created to pay for other types of assets.
2. The cash holdings of banks are equal to only a small fraction of bank-deposit liabilities.
3. One who "deposits" cash with a bank gets no preferred claim; he gives up title to the cash and takes his place with all other depositors as creditors of the bank.

Though deposits created to pay for net cash inflows to the banking system become indistinguishable from all other deposits, two characteristics of the process of creating deposits to pay for net inflows of cash should be noted:

1. In this case, and this case only, the transaction that creates deposits also increases the banks' holdings of cash, the latter constituting legal reserves for the banks. Such deposits that arise in transactions and

which also increase the legal reserves of banks are called *primary deposits*. Those created to pay for other assets that will not serve as reserves are called *derivative deposits*; these are derived from the purchase of such things as loans and securities.

2. When the commercial banks create checking deposits to pay for net cash flows to them, they do not themselves directly increase the total money supply. If the cash flows in from circulation, the increase of money in the form of checking deposits is offset by the decrease of coin and paper money in circulation. If the net cash flow to the bank results from new creations of money by the Treasury or the Federal Reserve, it is these institutions, not the banks, that initially increase the money supply. However, we shall see that net flows of cash into the banks have the very important effect of enabling the banks to create more money by purchasing other assets.

Deposits for Debt Claims

By far the largest part of outstanding deposits was created to pay for assets in the form of debt claims against others. Suppose the banks increase their loans to customers by $10 billion, giving their customers checking deposits. The effects on the banks' balance sheets are as follows:

ASSETS	LIABILITIES
Loans + $10 billion	Demand deposits + $10 billion

The banks have created $10 billion of money that did not exist before, and have done so by purchasing debt claims. In effect, the banks traded debts with their customers, presumably to their mutual satisfaction. The banks acquired debts that are not themselves money but which yield income in the form of interest or discount. The borrowers acquired debt claims (deposits) that usually yield no income but which have the advantage of being generally acceptable in payment for all kinds of goods and services. In short, the banks monetized debt.

Banks do not by any means confine their granting of credit to short-term loans to their customers. They also lend for longer terms to their customers and buy various sorts of securities in the open market from sellers they do not even know. Among these are such things as government securities, corporation bonds, and mortgages. We should not be surprised to find that banks create checking deposits in buying such assets. Suppose the banks purchase $10 billion of securities. The effects on their balance sheets will be:

ASSETS	LIABILITIES
Securities + $10 billion	Demand deposits + $10 billion

The banking system has created $10 billion of money that did not exist before, and has done so by purchasing debt claims against others. Here, again, it has monetized debt.

Two points that are crucial to an understanding of commercial banking should be emphasized:

1. Most checking deposits are derivative deposits, that is, deposits created in the process of bank purchases of debt claims against others.
2. Checking deposits created to pay for such assets are a net addition to the money supply; there is no offsetting decrease of coin and paper money in circulation.

THE DESTRUCTION OF CHECKING DEPOSITS

Checking deposits are extinguished by processes just the reverse of those that create deposits. They are destroyed as the banking system decreases its assets in the form of cash, loans, and securities.

Net Cash Drains

The banking system as a whole may suffer a net drain of its cash assets, either through net withdrawals of coin and paper money for circulation outside the banks or because of a net decrease in the amount of money provided by the Treasury and the Federal Reserve. In either case, those withdrawing the cash will probably do so by drawing down their checking deposits at the banks.

Suppose the cash assets of the banking system are reduced by $500 million. The banks' balance sheets will be affected as follows:

Assets	Liabilities
Cash − $500 million	Demand deposits − $500 million

In the process of selling $500 million of cash assets, the banks destroyed $500 million of their outstanding deposit liabilities.

Two aspects of this particular process of reducing the volume of checking deposits should be noted. First, when checking deposits are reduced by net outflows of cash from the banking system, the banks themselves do not directly decrease the total money supply. If the cash flows out into circulation, the decrease of money in the form of checking deposits is offset by the increase of coin and paper money in circulation. If the net cash loss by the banks resulted from a net withdrawal of money by the Treasury and the Federal Reserve, it is these institutions, not the banks, that initiated the decrease of the money supply. Second, the drain of cash from the banks may have very important repercussions, for it may force the banks to decrease the money supply by selling other assets.

Net Reductions in Bank Assets in the Form of Debt Claims

Most reductions in the volume of checking deposits are traceable to net reductions of bank assets in the form of debt claims against others. Suppose that the banking system reduces its outstanding loans by $5 billion. The former borrowers usually repay loans by drawing checks against their deposit accounts; bank liabilities are reduced accordingly. The effects on the banks' balance sheets are:

Assets	Liabilities
Loans − $5 billion	Demand deposits − $5 billion

In this process of reducing their outstanding loans, the banks have destroyed $5 billion of money in the form of checking deposits. This is a net reduction of the money supply; there is no offsetting increase of coin and paper money in circulation.

Similar results flow from net reductions of bank holdings of securities. Suppose the banking system sells $3 billion of its security holdings, the buyers paying for them by relinquishing checking deposit claims against the banks; this will affect the banks' balance sheets as follows:

Assets	Liabilities
Securities − $3 billion	Demand deposits − $3 billion

Here, again, the banks have destroyed checking deposits and decreased the total money supply through net sales of their debt claims against others.

Summary

The preceding sections traced out the processes through which the commercial banking system creates checking deposits by purchasing various types of assets and destroys checking deposits by net sales of assets. During some periods the banks may make net purchases of some types of assets and net sales of others. It should be evident that the net change in the volume of checking deposits during any period will equal the net change in total bank assets—still assuming that the banks issue claims only in the form of checking deposits.

OTHER CLAIMS AGAINST COMMERCIAL BANKS

In the preceding sections we explicitly assumed that commercial banks issued only demand deposit claims against themselves, and implicitly assumed that all these checking deposit claims were owned by the public and thus were a part of the public's money supply. We did this to high-

light the important point that the banks can indeed increase the public's money supply by purchasing assets, and can decrease the public's money supply by making net sales of assets. Now we must take into account two facts that will complicate our analysis: (1) that banks issue and withdraw claims other than demand deposits, and (2) some demand deposits are owned not by the public but by the United States government and foreigners. These facts are illustrated in Table 4–2.

TABLE 4–2. Assets of and Claims Against All Commercial Banks in the United States, December 28, 1962
(amounts in billions)[a]

Assets		Liabilities and Capital Account	
Cash in vault	$ 4.3	Capital account	$ 24.1
Deposits at Federal Reserve	17.7	Other liabilities (net)	4.8
Loans	140.1	Time deposits	97.8
Securities	95.7	Demand deposits owed to:	
		U.S. government	6.8
		Foreigners	1.2
		Public	123.1
Total	$257.8	Total	$257.8

[a] This is a consolidated balance sheet, omitting claims of commercial banks against each other. The item "Other liabilities (net)" is a net figure reflecting other liabilities minus some minor asset items.

Note first the other claims against banks. As stated earlier, "capital accounts" is simply the value of ownership claims against banks. Time deposits, a term that for brevity we shall use to cover both time and savings deposits, are liabilities that banks are not legally required to pay on demand, but only at some future date or some stipulated period after the depositor has given notice of his intention to withdraw. In practice, banks usually waive these legal rights, but they ordinarily do not permit time deposits to be transferred to others in payment. Demand deposits liabilities to the United States government and to foreigners are like other checking deposits except for their ownership.

Because banks can create and issue these other types of claims, they can acquire and hold larger amounts of loans, securities, and other assets than would be possible if they issued only demand deposits. This was indicated in the earlier equation:

$$\text{Assets} = \text{demand deposits} + \text{time deposits} + \text{other liabilities} \\ + \text{capital accounts}$$

The banking system can acquire assets equal to the value of all these claims that banks are willing to issue and others to hold. This complicates the relationship between the volume of the banks' assets and the volume

of the public's checking deposit claims against banks. When banks make net purchases of assets, they may pay for them not by creating new checking deposits for the public, but by creating other types of claims. And when they make net sales of assets, they may withdraw and retire not checking deposits from the public, but other types of claims. Yet it still remains true that the net increases of bank assets will result in increases of the public's holdings of checking deposits to the extent that the assets are not paid for by creating other types of claims on banks. And net sales of assets by banks will decrease the public's holdings of checking deposits to the extent that other claims against the banks are not reduced.

Let us now look more closely at the composition of the claims against banks. The volume of any one type of these claims can be decreased as claimants surrender some of them in exchange for other claims, and can be increased as claimants surrender other claims for it. For example, the public's holdings of demand deposits can be decreased as the public surrenders some of these deposits to buy ownership claims against banks, to buy time-deposit claims, or to make net payments to the government or foreigners by transferring demand deposits to them. And the public's demand deposits can be increased as the public surrenders time-deposit claims in exchange for checking deposits or has net receipts of checking deposits from the accounts of the government or foreigners.

If we call all these other claims against banks "nonmonetary claims" because we do not include them in the money supply, we get the following relationships:

$$\text{Demand deposits} = \text{assets} - \text{nonmonetary claims}$$

This is illustrated in Table 4–3. For example, the \$123.1 billion of demand deposits owned by the public on December 28, 1962, resulted from total bank assets of \$257.8 billion minus outstanding nonmonetary claims of \$134.7 billion. It also follows that the *change* in the volume of the public's demand deposits between any two points of time is equal to the *change* in total bank assets minus the *change* in total nonmonetary claims. Note, for example, the net changes during the 15-year period between the end of 1947 and the end of The \$36 billion increase in the public's holdings of demand deposits reflected a \$121.5 billion increase of total bank assets minus an \$85.5 billion increase of nonmonetary claims against the banks. Note also that almost the entire increase in bank assets was in loans and securities. This type of analysis can be used even by those who do not accept our definition of the money supply and would like to include in "money" some other commercial-bank liabilities, such as time deposits or demand deposits owned by the United States

government. They need only move the liabilities they wish to regard as money from the status of nonmonetary claims to the same status we have accorded to demand deposit liabilities to the public.

TABLE 4–3. Changes in Assets of and Claims Against Commercial Banks (in billions)

	Amount Dec. 31, 1947	Amount Dec. 28, 1962	Change during Period
ASSETS			
Cash in vault	\$ 2.2	\$ 4.3	+\$ 2.1
Deposits at Federal Reserve	17.8	17.7	− 0.1
Loans	38.1	140.1	+ 102.0
Securities	78.2	95.7	+ 17.5
Total assets	\$136.3	\$257.8	+\$121.5
Minus:			
NONMONETARY CLAIMS			
Capital account	10.1	24.1	+ 14.0
Other liabilities (net)	1.0	4.8	+ 3.8
Time deposits	35.4	97.8	+ 62.4
Demand deposits of:			
U.S. government	1.3	6.8	+ 5.5
Foreigners	1.4	1.2	− 0.2
Total nonmonetary claims	\$49.2	\$134.7	+\$ 85.5
Equals: DEMAND DEPOSITS OF THE PUBLIC	\$87.1	\$123.1	+\$ 36.0

Recognition of the fact that commercial banks are department stores of finance has complicated our analysis but has been necessary to emphasize two important points:

1. The banks can make loans and buy securities by creating not only demand-deposit claims but also claims of other types, principally time deposits. The capacity of the commercial banks to hold loans and securities would be smaller if the banks were not willing to create and others to hold time-deposit claims.

2. To the extent that the volume of these other claims change, changes in the volume of bank assets will not be accompanied by changes in demand deposits. Yet all this should not be permitted to obscure the fact that the commercial-banking system can and does create money by purchasing debt obligations, and that it can and does destroy money by reducing its holdings of debt obligations.

The fact that commercial banks create money primarily by purchasing loans and securities helps to explain why changes in the money supply

are likely to have important effects in the credit markets. As the banks create new money by purchasing loans and securities, the money is injected into the credit market in the first instance. It may be looked upon as either a new supply of loan funds or a new demand for debt obligations. This tends to lower interest rates and raise prices of debt obligations. On the other hand, as the banks reduce the money supply by decreasing their loans and security holdings, the money is in the first instance removed from the credit markets. This may be viewed as either a reduction in the supply of loan funds or a decrease in the demand for debt obligations. It tends to raise interest rates and to lower the prices of debt obligations. However, commercial banks are not the only lenders and do not by themselves determine the behavior of interest rates. The latter depends on the demand for loan funds and the total supply of loan funds, including the quantities supplied by other lenders, as well as those from commercial banks.

SOME RELATIONS AMONG BANKS

As noted earlier, this chapter is concerned with the commercial-banking system as a whole, not with any individual bank. We are concerned with aggregate effects, not with which bank does what. Yet it will be useful to consider here some of the relationships among the 13,500 banks spread over the 50 states, with no bank operating branches beyond the boundaries of its own state.

Interbank Payments

We have already noted that the banking system as a whole, as well as an individual bank, may gain or lose cash reserves, owing to net inflows or net outflows of cash. Cash flows into banks continuously in exchange for deposit claims, and cash is continuously withdrawn from banks and deducted from deposit accounts. Ordinarily these cash inflows and outflows largely offset each other, but at times there are net gains or losses. An individual bank within the system may also gain or lose cash reserves through interbank payments, which occur in huge volume. These arise in two principal ways:

1. *Through net purchases or sales of other assets by a bank for its own account.* For example, a bank may transfer some of its cash reserve (currency or deposits at the Federal Reserve) to buy loans or securities from another bank or from a customer of another bank. Or it may gain cash reserves by selling some of its loans or securities to another bank or a customer of another bank.

2. *Through net transfers of deposit claims among banks.* Huge amounts of payments are made by transferring, usually by check, deposit claims from payers to payees. Fortunately for banks, only a small fraction of these flows lead to net interbank payments and to net transfers of cash reserves from one bank to another.

For one thing, payers and payees are often depositors at the same bank. For example, both Jones and Whyte may be depositors at Bank A. If Jones gives a $1000 check to Whyte, Bank A will simply deduct that amount from its deposit liability to Jones and increase equally its deposit liability to Whyte. The bank's assets and total liabilities remain unchanged. But suppose payer and payee are not depositors in the same bank. Suppose Jones writes a $1000 check on Bank A and gives it to Whyte, who deposits it in Bank B. The latter will add $1000 to its deposit liability to Whyte and send the check to Bank A, which will deduct this amount from its deposit liability to Jones. Bank A now owes Bank B $1000, which it will pay by transferring this amount of its cash reserves if there are no offsetting transactions. But there are likely to be some offsetting transactions, which will require other banks to pay Bank A.

In the course of every day, large amounts of checks will be drawn on a bank and deposited in other banks, thus creating large liabilities for it to pay those banks. But at the same time, the bank will receive on deposit large amounts of checks drawn on other banks, thus giving it claims for payment by them. Since these will usually be largely offsetting, it would be both confusing and inefficient if each bank had to transfer cash reserves to meet the full value of its liability to pay other banks and to receive cash reserves equal to all its claims for payment by other banks. How much more efficient it would be to offset these flows to the maximum possible extent and transfer cash reserves only to cover net payments or receipts. A complex clearing and collection system has been developed for this purpose. It includes local clearing houses, correspondent banks, and the Federal Reserve banks. At least once a day, and sometimes oftener, these organizations compare for each bank the flow of checks drawn on it, and deposited with other banks, with the flow of checks deposited with it and drawn on other banks. Each bank then receives the net amount due it or pays the net amount owed by it. And these net payments are usually made by transferring cash reserves.

As might be expected in a system including thousands of banks, each operating only in a restricted area, net interbank transfers are sometimes large. Some of these are seasonal in character. For example, a bank in a resort area knows that it will gain deposits and reserves in the peak season

when its depositors are receiving large payments from visitors from other areas, and that it will lose deposits and reserves in the off season when its depositors' incomes are down and they are buying supplies for the coming season. A bank in a wheat-growing area is likely to gain deposits after harvest and lose them later. Some are cyclical in nature. For example, a bank in a steel-producing area is likely to gain deposits when sales of steel are high and to lose them when steel is in the doldrums. Or a bank may lose deposits and reserves simply because the public comes to prefer some other bank.

These interbank transfers of funds must be borne in mind for several reasons. In the first place, they help to explain why banks seek to attract deposits away from other banks. A bank that succeeds in this can thereby draw reserves from other banks and increase its lending power. In the second place, they make the "liquidity problem" of an individual bank quite different from that of the commercial-banking system as a whole. An individual bank must be able to meet not only its customers' demands for coin and currency, but also its payments to other banks. And in the third place, because of these interbank transfers, an individual bank that receives an initial addition to its cash reserves usually cannot expand its loans, investments, and deposits by a multiple amount. The bank must recognize that at least some of the deposits that it creates by making loans or buying securities will be checked out to other banks, thereby necessitating transfer of all or some of the initial increase of cash reserves.

Correspondent Relationships

No account of interbank relations would be complete without mention of "correspondent banking" in the United States. This is the arrangement under which some banks hold deposits with other banks and use these banks as agents in various types of transactions, such as check clearing and collection, purchases and sales of securities, purchases and sales of foreign exchange, and participations in large loans. This is our domestic counterpart of international correspondent banking, under which banks located in different countries hold deposits with each other and act as agents for each other in many types of transactions. Nations with only a small number of banks, each operating a nation-wide system of branches, have no need for such a highly developed domestic correspondent system. In such cases, each bank has an office in the country's major financial center and can reach all parts of the country through its own branches. The importance of correspondent relationships in the United States derives from the structure of our banking system: the fact

that most of our thousands of banks operate only one office, that no branch bank is permitted to have branches outside its home state, and that many of our banks are relatively small.

The center of American correspondent banking is New York City, the nation's great financial center, with its foreign-exchange market, its short-term money market, and its long-term capital markets. Almost every important bank in the country maintains correspondent relations with at least one large bank in that city. Chicago is the next most important center. Each of its two largest banks has more than a thousand correspondents. In addition there are many regional centers, among them Boston, Philadelphia, Atlanta, New Orleans, Cleveland, St. Louis, Kansas City, Dallas, San Francisco, and Seattle. The network of correspondent relations is complex, for many banks hold deposits in more than one center, and correspondent banks in one center often have correspondent relations with banks in other centers. Thus, a bank in a small Missouri town may have deposits in a St. Louis bank and possibly in a Chicago or New York bank, and the St. Louis bank is almost certain to have deposits in Chicago or New York, or both.

These interbank deposits serve several functions. Among these are:

1. *To serve as legal reserves.* Though members of the Federal Reserve may count as legal reserves only their cash in vault and deposits at the Federal Reserve banks, nonmember banks have more leeway. The relevant state laws permit most nonmember banks to hold at least a part of their legal reserves, usually a large part, in the form of deposit claims against other commercial banks.

2. *To facilitate check clearing and collection.* Many banks have their correspondent banks pay at least some of the checks drawn on them and collect checks on other banks that are deposited with them. A New Jersey bank may have such an arrangement with the Chase Manhattan Bank of New York. If so, at least some checks drawn on the New Jersey bank and deposited with other banks will be routed to Chase Manhattan, which will deduct them from the New Jersey bank's deposit account. And checks drawn on other banks and deposited with the New Jersey bank will be sent to Chase Manhattan, which will credit the New Jersey bank's deposit account and send the checks along for collection.

3. *To facilitate domestic and foreign payments.* A customer of the New Jersey bank may want to make payments with a draft drawn on a New York bank or on some foreign bank. Holding deposits at Chase Manhattan, the New Jersey bank can draw drafts on that bank or on a foreign correspondent of that bank.

4. *To facilitate agency operations.* The New Jersey bank may use

Chase Manhattan as an agent to buy or sell securities, to make loans for it on the Stock Exchange, or to accept or draw drafts. Interbank deposits that can be credited or debited to finance these transactions are helpful.

5. *To increase the geographical mobility of credit*. Banks with funds in excess of their current needs can increase their deposits at correspondent banks, thereby shifting reserves to them and increasing their lending power. On the other hand, banks that wish to increase their other assets or to meet withdrawals may withdraw some of their deposits from their correspondent banks. Geographical mobility of credit is also promoted, of course, when banks buy securities and other assets outside their own locality, or sell some of their securities and other assets to buyers outside their own locality.

5. Bank Expansion and Contraction

It should not be assumed that banks would find it profitable to expand to such lengths if they were free of official regulation. For one thing, banks do not find it costless to create deposit claims and to entice the public to hold very large amounts of them. They must pay interest to get the public to hold large amounts of time deposits, and it would be very costly for banks to pay interest rates high enough to attract all funds away from competing claims, such as claims against savings and loan associations, credit unions, and investment companies. They could, of course, create more demand deposits, on which they are presently prohibited by law from paying interest. These are not costless, for the bank must provide services to depositors—such things as checkbooks, accounting services, check clearing and collection, and so on. However, the marginal costs of creating additional demand deposits are probably so low relative to the additional income that would be yielded by the additional earning assets, that this consideration would not be a strong deterrent to money creation. If banks were free of official control, the most powerful deterrent *to an unlimited expansion of deposits would be their obligation to* keep their deposits redeemable in currency.

In discussing the evolution of fractional-reserve banking, we noted that banks discovered that they could usually keep their liabilities redeemable in currency if they held cash reserves equal to some fraction, such as an eighth or a tenth, of their liabilities. In other words, it was relatively safe to create liabilities equal to 10 or 12 times their cash reserves. But expansion of bank liabilities beyond some such multiple becomes increasingly dangerous. If a bank attempted to expand *its liabilities too far, it* could so damage the public's confidence in its ability to pay currency on demand that the quantity of its liabilities that it could keep outstanding would actually be reduced. The bank could even be forced into failure by its inability to honor its promises to pay currency on demand. Unfortunately, in the past, many banks discovered this too late.

5. Bank Expansion and Contraction

We have already surveyed the operation of commercial banks, both as suppliers of credit by purchasing debt claims against others and as creators and issuers of deposit claims against themselves. Now we must analyze these operations more closely, asking such questions as these: What are the motivations of banks? What factors determine the maximum volume of loans and securities that the banking system can acquire and hold, and the maximum volume of deposit liabilities that it can have outstanding? What factors determine the actual behavior of bank assets and liabilities within these maximum limits? How can the central bank or other monetary authority regulate the volume of bank assets and liabilities?

BANK OBJECTIVES

From the point of view of its owners, the primary purpose of a commercial bank is to make profits. To say that it strives to maximize profits in either the short or long run might be to put the matter too simply; but to say that it deliberately deviates very far or for very long from this purpose would probably be even more misleading. We have found that banks earn gross income when they buy debt claims against others by issuing deposit claims on themselves. Why, then, do they not buy up all the debt instruments in the economy and monetize them? Why should banks stop with monetizing all the debts that they could induce governments, business firms, and individuals to issue? Why should they not proceed to buy up great quantities of real goods that yield an income, paying for them with newly created deposits?

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There is a real danger that banks would operate in a highly inflationary manner if they were free of official control. Moreover, their money-creating and money-destroying activities might be such as to accentuate cyclical fluctuations. In boom periods, when optimism reigns and the demand for bank loans is high, they might create large amounts of new money, thereby "booming the boom." Then, in depression periods, when the outlook is gloomy and risks increasing, they might seriously reduce the money supply, thereby deepening and prolonging the depression. Such dangers are so great that the creation of money by commercial banks is now subject to limitation and regulation in practically every

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BANK OBJECTIVES

From the point of view of its owners, the primary purpose of a commercial bank is to make profits. To say that it strives to maximize profits in either the short or long run might be to put the matter too simply; but to say that it deliberately deviates very far or for very long from this purpose would probably be even more misleading. We have found that banks earn gross income when they buy debt claims against others by issuing deposit claims on themselves. Why, then, do they not buy up all the debt instruments in the economy and monetize them? Why should banks stop with monetizing all the debts that they could induce governments, business firms, and individuals to issue? Why should they not proceed to buy up great quantities of real goods that yield an income, paying for them with newly created deposits?

It should not be assumed that banks would find it profitable to expand to such lengths if they were free of official regulation. For one thing, banks do not find it costless to create deposit claims and to entice the public to hold very large amounts of them. They must pay interest to get the public to hold large amounts of time deposits, and it would be very costly for banks to pay interest rates high enough to attract all funds away from competing claims, such as claims against savings and loan associations, credit unions, and investment companies. They could, of course, create more demand deposits, on which they are presently prohibited by law from paying interest. These are not costless, for the bank must provide services to depositors—such things as checkbooks, accounting services, check clearing and collection, and so on. However, the marginal costs of creating additional demand deposits are probably so low relative to the additional income that would be yielded by the additional earning assets, that this consideration would not be a strong deterrent to money creation. If banks were free of official control, the most powerful deterrent to an unlimited expansion of deposits would be their obligation to keep their deposits redeemable in currency.

In discussing the evolution of fractional-reserve banking, we noted that banks discovered that they could usually keep their liabilities redeemable in currency if they held cash reserves equal to some fraction, such as an eighth or a tenth, of their liabilities. In other words, it was relatively safe to create liabilities equal to 10 or 12 times their cash reserves. But expansion of bank liabilities beyond some such multiple becomes increasingly dangerous. If a bank attempted to expand its liabilities too far, it could so damage the public's confidence in its ability to pay currency on demand that the quantity of its liabilities that it could keep outstanding would actually be reduced. The bank could even be forced into failure by its inability to honor its promises to pay currency on demand. Unfortunately, in the past, many banks discovered this too late.

There is a real danger that banks would operate in a highly inflationary manner if they were free of official control. Moreover, their money-creating and money-destroying activities might be such as to accentuate cyclical fluctuations. In boom periods, when optimism reigns and the demand for bank loans is high, they might create large amounts of new money, thereby "booming the boom." Then, in depression periods, when the outlook is gloomy and risks increasing, they might seriously reduce the money supply, thereby deepening and prolonging the depression. Such dangers are so great that the creation of money by commercial banks is now subject to limitation and regulation in practically every

5. Bank Expansion and Contraction

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country. In the United States this is achieved primarily through regulating the *dollar volume of reserves* available to the commercial banks and imposing *legal minimum reserve requirements.*

RESERVES AND RESERVE REQUIREMENTS

It must be emphasized that the primary purpose of legal reserve requirements is not to force banks to remain "liquid" enough to be able to meet their obligations to pay. This may indeed have been the original purpose of these requirements. But the purpose now is to serve as a method of regulating the volume of bank deposits and, indirectly, th volume of bank assets.

This involves three steps by the government, central bank, or othe monetary authority:

1. Define those particular types of assets that can be counted toward meeting legal reserve requirements. These assets should be of such a type that their dollar value can be regulated by the monetary authority. For commercial banks that are members of the Federal Reserve System (and these account for about 85 percent of all commercial-bank liabilities), only two types of assets can be counted as legal reserves: cash in vault and deposit claims against the Federal Reserve banks.[1]

2. Regulate the dollar volume of legal reserves available to the banks: This is one of the major functions of the Federal Reserve.

3. Require the banks to hold legal reserves equal to *at least* some stated fraction of their deposit liabilities: We shall see later that the Federal Reserve is empowered to set such minimum fractional reserve requirements for member banks and to alter within limits the height of these minimum requirements. Note that to fix a minimum ratio of reserves to deposit liabilities is the same as fixing a maximum ratio of deposit liabilities to reserves. For example, to say to a bank, "You must hold reserves equal to at least 20 percent of your deposit liabilities," is the same as saying, "Your deposit liabilities may not exceed five times the volume of your reserves." And to say, "You must hold reserves equal to at least 10 percent of your deposits," is to say, "Your deposits may not exceed 10 times the volume of your reserves."

Thus, we find that the maximum volume of commercial-bank deposit liabilities that may be outstanding depends on (1) the dollar volume of reserves available to the banks, and (2) the size of the minimum legal ratio of reserves to deposits. This indicates why dollars in bank reserves

[1] From 1917 to 1959, only deposit claims against the Federal Reserve could be counted as legal reserves by member banks.

are often referred to as "high-powered" money; under a fractional-reserve system, each dollar of legal reserves can "support" several dollars of checking deposits. And the lower the required reserve ratio, the "higher powered" is each dollar of reserves.

This also introduces us to the two principal ways in which the Federal Reserve can regulate the behavior of the money supply. Though it uses a number of instruments, they are all aimed at regulating either the dollar volume of reserves available to commercial banks or the height of the minimum legal ratio of reserves to deposit liabilities. These are, in the first instance, methods of regulating the volume of commercial-bank deposit liabilities. But they also regulate indirectly the volume of bank loans and security holdings, for changes in these would affect the volume of deposits.

The combination of the dollar volume of bank reserves and the legal minimum reserve ratio determines only the *maximum* level of deposit liabilities; it does not force the banks to expand their holdings of loans and securities until this ceiling on their deposit liabilities is reached. The only pressure on banks to reach this maximum comes from the profit motive. Dollars of excess reserves yield no interest; loans and securities do. Usually, therefore, banks are impelled to expand their loans and security holdings to the maximum permitted by their reserve positions. However, there may be times, especially in depression periods, when bankers believe that risks of lending and buying securities are so high relative to prevailing interest rates that they prefer to hold some excess reserves, and therefore they fail to expand their deposit liabilities to the maximum permitted by their reserve positions.

CHANGES IN THE VOLUME OF BANK RESERVES

It should be intuitively plausible that an initial change in the volume of reserves available to a banking system operating on fractional reserves will permit or necessitate a change in bank deposits and assets equal to some multiple of the initial change in reserves. And the size of the multiple will tend to be larger as the fractional-reserve requirement is smaller. Thus, each dollar increase in reserves will permit the banking system to expand deposits and earning assets by some multiple. If the banks lose a dollar of reserves when they hold no reserves in excess of legal requirements, they will have to reduce by some multiple their deposit liabilities and assets. This multiple expansion or contraction of the deposits and assets of a banking system in response to an initial change in the volume of its reserves occupies a central role in com-

mercial-banking theory and is of crucial importance to monetary authorities charged with responsibility for regulating the volume of bank liabilities and assets.

We shall be interested not in just one multiple but in several: those relating to (1) demand deposits; (2) total deposits, including both demand and time; (3) bank earning assets, including both loans and securities; and (4) the money supply, including both changes in demand deposits and changes in currency in circulation outside banks. In some cases, the sizes of these multiples can differ significantly.

Several aspects of our analysis should be borne in mind:

1. In the following section we shall be dealing with the banking system as a whole. The multiples that will be developed do not apply to an individual bank experiencing an initial change in its reserves. This case will be treated later.
2. The multiples apply to an *initial* change of reserves because a resulting expansion may induce some loss of reserves and a contraction may induce some gain in reserves. Moreover, the multiples apply to initial changes in excess reserves or to a deficiency of reserves relative to requirements.
3. The multiples apply to derivative deposits only and do not include any initial change that occurs in primary deposits.

The last two points require explanation. The banking system can experience a change in its reserves, either through a change in primary deposits or without a change in primary deposits. An example of the latter would be \$100 increase in bank reserves resulting from bank borrowings from the Federal Reserve. The initial effects on the balance sheet of the commercial banks would be as follows:

Assets	Liabilities
Reserves + \$100	Borrowings from the Federal Reserve + \$100

Since banks are not required to hold reserves against liabilities in the form of borrowings from the Federal Reserve, the entire \$100 increase in reserves constitutes an increase in excess reserves, and all these serve as a basis for a multiple expansion of derivative deposits and of bank holdings of loans and securities.

Consider now the case in which the banking system receives a \$100 initial increase in its reserves through an increase of primary deposits. This could reflect such events as a net inflow of currency from circulation, an increase in the country's monetary gold stock, or a Federal Reserve purchase of securities from the public. Suppose further that reserve requirements against demand deposits average 15 percent. The initial effect on the banks' balance sheets will be the following:

ASSETS	LIABILITIES
Reserves + $100	Demand deposits + $100
Addendum:	
Required reserves + $15	
Excess reserves + $85	

The $100 of primary deposits have indeed brought a $100 increase in the actual reserves of the banks. But excess reserves are increased only $85 because $15 are required as reserves against the primary deposit. Only this increase of excess reserves can serve as a basis for the multiple increase of derivative deposits and earning assets with which we shall be concerned.

It is not difficult, however, to adjust the results that we shall get to show the total effects on bank balance sheets when the initial change in reserves reflects a primary deposit. One need only add on the liability side the initial primary deposit and on the asset side the change in required reserves associated with the primary deposit.

In the following examples we shall assume that the initial changes of reserves reflect changes in the volume of bank borrowings at the Federal Reserve. But the same principles apply, of course, to any initial change in excess reserves, from whatever source.

MULTIPLE EXPANSION—A GENERAL SURVEY

Before analyzing rigorously the factors determining the size of the various multiples of expansion or contraction, let us consider the subject in more general terms.

Suppose the banks receive an initial increase in their excess reserves. Since these yield no interest or other income, the banks will feel impelled to use them as a basis for increasing loans, or buying securities, or both. Those members of the public who borrow from or sell securities to the banks will usually receive the proceeds in the form of new checking deposits. But regardless of the form in which the proceeds are initially received, the public is free to change the forms and proportions in which it will hold them. According to its preferences, it may continue to hold all the proceeds in the form of demand deposits, or it may hold some or all in time deposits, or it may take at least some to be held in the form of additional currency outside the banking system. The sizes of the various multiples will be affected substantially by the public's choices as to the forms and proportions in which it will hold the proceeds from new bank loans and security purchases.

If all the proceeds continue to be held as demand deposits, all the

initial increase of reserves remains in the banks to serve as a basis for additional demand deposits. The size of the multiples will then depend on the size of the fractional reserve requirement. For example, if the reserve requirement is 0.15, each $1.00 initial increase of reserves will support a $1.00/0.15, or $6.67, increase of demand deposits and also of bank loans and securities.

If the public elects to hold at least some part of the proceeds in time deposits, the sizes of the various multipliers are usually different. This is in part because reserve requirements against time deposits are usually much lower than those against demand deposits, though this is determined by law and by decision of the monetary authorities. For example, when reserve requirements against demand deposits are 0.15, the requirements against time deposits may be only 0.04.[2] In effect, each dollar of reserves will support more time deposits than demand deposits. Thus, the greater the proportions of the proceeds held in time deposits rather than demand deposits, and the lower the reserve requirement against time-deposits relative to those against demand deposits, the greater will be the multiple expansion of total deposits, including both demand and time. This is because the greater weight of time deposits with the lower reserve requirement serves to lower the weighted-average reserve requirement against total deposits. Also greater will be the multiple expansion of bank loan and security holdings, for banks can buy these assets by creating time-deposit claims as well as demand deposits. But the multiple expansion of demand deposits alone will be lower, for the banks must use some part of the initial increase of reserves to meet reserve requirements against the increase of time deposits.

All the multiples (those applying to the expansion of demand deposits, total deposits, and bank holdings of loans and securities) will be reduced if some of the proceeds are taken in the form of currency and held as such outside the banking system. We shall call this an "induced cash drain from the banking system." Each dollar withdrawn to serve as currency in circulation removes a dollar of the initial increase of reserves and leaves the banks with only a smaller net increase of reserves to support deposit creation. We shall find that induced cash drains can reduce markedly the sizes of the expansion multiples.

In summary, the sizes of the multiples of expansion of demand deposits, total deposits, and loans and security holdings permitted by each dollar of initial increase of reserves in the banking system depend on several things: the height of legal reserve requirements against demand

[2] As will be seen later, there is strong support for a zero reserve requirement against time deposits. If this were the situation, our point would be strengthened.

deposits and time deposits, respectively, and the proportions in which the proceeds from the increased bank loans and security holdings come to be held as demand deposits, time deposits, and currency outside banks.

Consider now the reverse process, that is, the multiple contraction of bank deposits and earning assets required in response to an initial loss of reserves. Suppose the banking system suffers an initial net loss of reserves when it holds no reserves in excess of legal requirements. With their actual reserves now deficient relative to the amounts legally required, the banks will be forced to begin reducing their outstanding loans or selling securities, or both, in an effort to remedy their reserve deficiencies. Those who buy securities from the banks or repay loans to the banks must surrender something in payment. These net payments to the banks can occur in various forms and proportions. The public might pay the banks entirely by surrendering demand-deposit claims, or it might pay at least in part by surrendering time-deposit claims or currency formerly held outside the banking system. The sizes of the multiples of contraction of bank deposits and earning assets will be substantially affected by the public's choices among the methods of paying the banks.

Suppose the public pays the banks entirely by relinquishing demand-deposit claims. In this case, there is no induced currency flow into the banks to offset any part of the initial loss of reserves. The banks must remedy their reserve deficiency entirely by reducing their loans and security holdings, thus extinguishing demand deposits and lowering the volume of their required reserves. The sizes of the necessary multiples of contraction will then depend on the size of the fractional-reserve requirement. For example, if the reserve requirement is 0.15, each \$1.00 initial loss of reserve will require a contraction of \$1.00/0.15, or \$6.67, of demand deposits and also of bank loans and security holdings.

The multiples will be different if the public makes at least some of the necessary payments to banks by relinquishing time-deposit claims. Suppose all the payments are made in this way and that the reserve requirement against time deposits is 0.04. For each dollar of reserves lost, the banks would have to reduce time deposits and also their holdings of loans and securities by \$1.00/0.04, or \$25. More generally, the greater the proportion of payments made to the banks with time deposits rather than demand deposits, and the lower the reserve requirement on time deposits relative to that on demand deposits, the greater will be the necessary multiple contraction of total deposits. Also greater will be the necessary multiple contraction of bank loans and security holdings. But the necessary contraction of demand deposits alone will be smaller, for the contraction of time deposits reduces the volume of reserves required

against them and to this extent lessens the amount of adjustment that must be made by reducing demand-deposit liabilities.

All the multiples of necessary contraction (of demand deposits, time deposits, and bank holdings of loans and securities) will be smaller if the public surrenders in payment to the banks some currency formerly held outside the banking system. We shall call this an "induced cash inflow." Each dollar of induced cash inflow offsets a dollar of the initial loss of reserves and thus reduces the extent to which the banks must repair their reserve deficiency by contracting their deposit liabilities.

We have now described in general terms the multiples of expansion permitted by an initial increase in the reserves of the banking system, and the multiples of contraction required by an initial loss of reserves. We have also noted some of the factors determining the sizes of the multiples. Let us now analyze these more closely, using the following symbols:

ΔA = the initial change in the volume of reserves of the banking system.

r = the fractional-reserve requirement against demand deposit liabilities. If reserve requirements against deposits are different for various classes of banks, r is the weighted average of these requirements.

b = the fractional-reserve requirement against time deposits.

ΔD = change in the dollar volume of demand deposits. In the case of an initial increase of reserves, ΔD is the maximum permitted expansion. In the case of an initial loss of reserve, ΔD is the minimum required contraction.

ΔT = change in the volume of time deposits. At times, it will be convenient to state this as $\Delta T = n\,\Delta D$, thus stating ΔT as a fraction or multiple of ΔD.

ΔL = change in the volume of loans and security holdings of the banking system.

ΔC = net induced cash drain from the banking system in the case of bank expansion, and net induced cash inflow in the case of bank contraction. This will sometimes be expressed as $\Delta C = s\,\Delta D$, thus stating ΔC as a fraction, s, of ΔD.

ΔM = change in the money supply. This is equal to $\Delta D + \Delta C$.

We shall now proceed to develop and compare three different cases of multiple expansion and contraction. In order to compare the sizes of the multiplier, we shall in all cases assume that:

(1) $\Delta A = \$100$, reflecting an equal change in bank borrowings from the Federal Reserve

(2) $r = 0.15$

(3) $b = 0.04$

The reader should find it useful, however, to work through the various cases, using other values for r and b.

CASE I: $\Delta T = 0$ AND $\Delta C = 0$

We start with the simple case in which expansion or contraction by the banking system involves no change in time deposits and no induced cash drain or cash inflow. Otherwise expressed, $n = 0$ and $s = 0$. Thus, no part of the initial gain or loss of reserves comes to be offset by an induced cash drain or cash inflow, and the banks must adjust to the gain or loss of reserves solely by changing the volume of their demand-deposit liabilities.

Expansion

Suppose the banks receive an initial increase in their reserves equal to ΔA. With this accretion to their excess reserves, they can proceed to create additional demand deposits (ΔD) by expanding their holdings of loans and securities (ΔL). They will have expanded to the maximum permitted by ΔA only when they have expanded deposits so much that their required reserves ($r\,\Delta D$) have risen by an amount equal to the initial increase of excess reserves. In other words, maximum expansion has been reached when

$$r\,\Delta D = \Delta A \quad \text{or} \quad \Delta D = \Delta A\,\frac{1}{r}$$

Substituting our assumed values of $\Delta A = \$100$ and $r = 0.15$, we get

$$\Delta D = \$100\,\frac{1}{0.15} = \$666.67$$

The net changes on the balance sheet of the banking system will be as follows:

Assets	Liabilities
$\Delta A = +\$100$	Borrowings from the Federal Reserve + \$100
$\Delta L = +\$666.67$	$\Delta D + \$666.67$

For purposes of comparison with the cases that follow, it should be noted that in this case $\Delta L = \Delta D = \Delta M$. In other words, the expansion of bank loans and security holdings was accompanied by an equal increase in checking deposits and an equal increase in the money supply because the volume of currency outside banks remained unchanged.

Contraction

We can deal with contraction briefly because both the process and the reasoning are quite comparable to those above. Suppose that at a time when they hold no reserves in excess of legal requirements, the banks

suffer an initial loss of reserves equal to ΔA. Now that their reserves are deficient, the banks must proceed to reduce their demand-deposit liabilities (ΔD) by reducing their loans and security holdings (ΔL). They will have contracted by the minimum necessary amount only when they have reduced deposit liabilities so much that their required reserves ($r\,\Delta D$) have decreased by an amount equal to the actual loss of reserves. In short, the minimum required contraction has been reached when

$$r\,\Delta D = \Delta A \quad \text{or} \quad \Delta D \ \Delta A \frac{1}{r}$$

Again substituting our assumed values,

$$\Delta D = -\$100 \frac{1}{0.15} = -\$666.67$$

The following changes will appear on the balance sheet of the banking system:

Assets	Liabilities
$\Delta A - \$100$	Borrowing from the Federal Reserve $- \$100$
$\Delta L - 666.67$	$\Delta D - 666.67$

Note that here, again, $\Delta L = \Delta D = \Delta M$. By decreasing their loans and security holdings, the banks have destroyed equal amounts of both checking deposits and the money supply.

CASE II: $\Delta C = 0$

In this case, we shall still assume that in the process of expansion or contraction, the banks experience no net cash drain or inflow, but we recognize that there may be induced changes in time deposits (ΔT). Whether or not such changes in T will occur, and how large they will be relative to changes in demand deposits, depend on many things, such as the nature of service charges on demand deposits, the height of interest rates on time deposits, the characteristics of other available claims and the height of their yields, changes in income levels and rates of saving, and so on. Without delving further into the relevant motivations, we shall assume that time deposits do expand and contract as banks expand and contract their earning assets, and that $\Delta T = n\,\Delta D$. In our numerical example, we shall let $n = ½$. That is, every \$1.00 of ΔD is accompanied by a 50-cent ΔT.

Expansion

Again suppose that bank reserves are increased in the amount ΔA. On the basis of these new excess reserves, the banks can expand their holdings

of loans and securities, thereby creating deposit liabilities. The proportions in which these proceeds will come to be held in demand deposits and in time deposits depend on the public's choices between these two types of assets. The expansion will have reached the maximum only when the sum of the increase in reserves required against the increase of demand deposits ($r\,\Delta D$) plus the increase in reserves required against the increase in time deposits ($b\,\Delta T$ or $nb\,\Delta D$) is equal to the actual increase of reserves, ΔA. In other words, maximum expansion is reached only when

$$r\,\Delta D + nb\,\Delta D = \Delta A$$
$$\Delta D(r + nb) = \Delta A$$
$$\Delta D = \Delta A \frac{1}{r + nb}$$

By substituting our assumed values of $\Delta A = \$100$, $r = 0.15$, $b = 0.04$, and $n = ½$, we get

$$\Delta D = 100 \frac{1}{0.15 + 0.02} = \$588.23$$

Since we assumed n to be ½, $\Delta T = ½\,\Delta D$, or \$294.12. And since all the proceeds from the increase of bank loans and security holdings came to be held as demand and time deposits, $\Delta L = \Delta D + \Delta T$, or \$882.35. Here is how the changes would appear in the balance sheet of the banking system:

Assets	Liabilities
$\Delta A = +\$100.00$	Borrowings from the Federal Reserve + \$100
$\Delta L = +882.35$	$\Delta D = +588.23$
	$\Delta T = +294.12$

Addendum: change in reserves required against

Demand deposits	$= 588.23 \times 0.15 =$	\$ 88.24
Time deposits	$= 294.12 \times 0.04 =$	11.76
	Total	\$100.00

A glance at the "addendum" shows that the banks have indeed expanded to the maximum, for all \$100 initial increase of reserves is now "used up" in meeting the \$88.24 of reserves required against the expansion of demand deposits and the \$11.76 increase of reserves required against the new time deposits.

A comparison of the results in this case with those in Case I highlights some important points. If the proceeds from an expansion of bank loans and security holdings do not all come to be held as demand deposits, but some are instead reflected in an increase of time deposits, the sizes of the various multiples will be affected as follows:

1. The total deposit multiple will be greater. This is because b is lower than r. And the size of the multiple will be greater as n is higher and as b is smaller relative to r.
2. The multiple of expansion of loans and security holdings will also be greater, for the banks can acquire earning assets by creating both time and demand-deposit liabilities.
3. The multiple expansion of demand deposits alone will be smaller. This is because some part of the initial increase of reserves is "used up" to meet reserve requirements against the additional time deposits. Of course, if reserve requirements against time deposits were zero, this would not be true.
4. The multiple expansion of the total money supply, as we define it, will also be smaller, for we exclude time deposits from the money supply.

Contraction

Because the process of contraction is so comparable to the process of expansion discussed immediately above, we shall not trace it through. Rather, we request the reader to do so. Assume that at a time when they hold no reserves in excess of legal requirements, the banks suffer an initial loss of reserves equal to ΔA. Then, as the banks decrease their loans and security holdings, the public pays in part by surrendering time-deposit claims. Let $\Delta T = n\,\Delta d$. Then solve for the minimum necessary contraction of D, $D + T$, L, and M *Suggestion:* Check your results by computing the changes in the volume of reserves required against ΔD and ΔT and comparing the sum with the actual initial change of reserves, ΔA.

CASE III: EXPANSION AND CONTRACTION WITH INDUCED CASH DRAINS AND INFLOWS

In the first two cases we assumed that, as banks expanded, they induced no net currency drain from the banking system and therefore lost none of the initial increase of reserves. And when they contracted, they induced no net currency flow into the banks and were not able to gain reserves in this way to offset some of the initial loss. In some cases, these assumptions are realistic, especially when the expansion or contraction is relatively small. But frequently (and even usually when expansions or contractions are large) net cash drains or inflows are induced. When these do occur, they can reduce markedly the sizes of the various multiples of expansion or contraction.

Why does the public tend to hold more currency as the banks increase the total money supply, and to hold less currency when the banking system contracts? The answers most frequently given are of two general types, though they do not necessarily conflict. One emphasizes that, given

the state of institutional arrangements and public attitudes, there will be some more or less fixed ratio of currency and checking deposits, which the public considers to be most advantageous. When the total money supply is increased, the public will elect to hold a major part of it in the form of deposits, but will take some part in additional currency. And when the total supply of money is decreased, the public will give up some currency as well as relinquish deposits.

The other approach emphasizes the behavior of the types of payments for which currency is widely held and used. These include payrolls and consumer expenditures to retail stores, restaurants, transportation companies, nightclubs, parking meters, gasoline stations, and so on. The amounts of currency that the public demands to hold may not vary in strict proportion with these expenditures, but they are likely to vary in the same direction. When the banking system expands its loans and security holdings to any considerable extent, the result is likely to be an expansion of expenditures in general, including payrolls and spendings of a retail nature. The public is therefore likely to demand more currency. But a sizable contraction of bank credit is likely to bring the opposite results, that is, a decrease of spendings in general, including payrolls and retail trade, and a net relinquishment of currency by the public.

It should be clear that these two approaches need not lead to conflicting conclusions and that some combination of them may be superior to either alone. But it will be sufficient for our purposes to assume that as banks expand, they do induce a net drain of currency into circulation (ΔC). And as banks contract, they induce a net inflow of currency from circulation. In this case, ΔC is negative. In both cases, ΔC will be expressed as a fraction s of ΔD. In our numerical example we shall let $s = 0.23$. Thus, $\Delta C = 0.23\Delta D$.

Expansion

Again we start with the assumption that the banking system enjoys an initial increase in its reserves (ΔA) and that it proceeds on this basis to expand its loans and security holdings. The public will hold the proceeds in the desired proportions in the form of additional demand deposits (ΔD), additional time deposits ($n\,\Delta D$), and additional currency ($s\,\Delta D$). In this case, the initial increase of reserves is "absorbed," or "used up," in three ways: as required reserves against the additional demand deposits ($r\,\Delta D$); as required reserves against the additional time deposits ($bn\,\Delta D$); and to meet the net induced drain of currency from the banking system ($s\Delta D$). The banks will have expanded to the maximum only

when all initial increase of reserves has been "absorbed" in these three forms. In short, maximum expansion is reached when

$$r\,\Delta D + nb\,\Delta D + s\,\Delta D = \Delta A$$
$$\Delta D(r + nb + s) = \Delta A$$
$$\Delta D = \Delta A\,\frac{1}{r + nb + s}$$

Substituting our assumed values of $A = \$100$, $r = 0.15$, $b = 0.04$, $n = \frac{1}{2}$, and $s = 0.23$, we get

$$\Delta D = \$100\,\frac{1}{0.15 + 0.02 + 0.23} = \$100\,\frac{1}{0.40} = \$250$$

We can also use this formula and our assumed values to compute othe magnitudes in which we are interested.

1. ΔT, which is stated as nD, is $\frac{1}{2}\Delta D$, or \$125.
2. The increase of total deposits, $\Delta D + \Delta T$, may be stated as $(1 + n)\,\Delta D$. In this case, it is $(1 + 0.5)\$250$, or \$375.
3. The net drain of currency into circulation, ΔC, is $s\,\Delta D$. In this case, it is $0.23\,\Delta D$, or \$57.50. Note that this represents both the amount of the initial increase of reserves that the banking system loses through the induced currency drain and the part of the increased money supply that the public elects to hold in the form of increased currency outside the banks.
4. The increase of bank loans and security holdings is equal to the sum of $\Delta D + \Delta T + \Delta C$. This reflects the fact that the banks can buy claims against others by creating demand and time-deposit claims and also by paying out some of its cash reserves to those who borrow from or sell securities to them. ΔL may also be expressed as $(1 + n + s)\,\Delta D$. In this case, $\Delta L = (1 + 0.5 + 0.23)\$250$, or \$432.50.
5. The increase of the public's money supply (ΔM) is equal to the increase in demand deposits plus the net induced drain of currency from the banks into circulation (ΔC). Since the latter is equal to $s\,\Delta D$, $\Delta M = (1 + s)\,\Delta D$. In this case, it is $(1 + 0.23)\$250$, or \$307.50.

The final effects on the balance sheet of the banking system will be these:

Assets		Liabilities
Initial ΔA	= +\$100.00	Borrowings from the Federal Reserve + \$100
Less: cash drain	57.50	
Remaining increase of reserves	42.50	$\Delta D = \$250$
		$\Delta T = \$125$
ΔL	= \$432.50	

Addendum: "absorption" of the initial \$100 increase of reserves.	
Loss of reserves through cash drain	\$ 57.50
Increase of reserve required against new demand deposits	37.50
Increase of reserve required against new time deposits	5.00
Total	\$100.00

The "addendum" indicates that the banks have expanded to the maximum, for all \$100 initial increase of excess reserves has been "used up" to meet the induced cash drain and as required reserves against the additional demand and time deposits.

As one compares the results in this case with those in Cases I and II, he cannot fail to be struck by the powerful force of an induced cash drain in reducing the sizes of the various multiples of expansion. This is because every dollar of cash drain removes from the banks a dollar of reserves which, if it had remained in the banks, would have "supported" several dollars of expansion of bank deposits and of bank holdings of loans and securities. This is a fact of great importance to anyone who would understand banking and also to monetary authorities charged with responsibility for regulating the money supply and the quantity of credit supplied by banks through their acquisition of loans and securities.

Contraction

Suppose that the banks suffer an initial loss of reserves, ΔA, at a time when they have no excess reserves, and that the ensuing bank contraction induces a net flow of currency into the banks. You are invited to trace through the process and to calculate the minimum necessary contractions of demand and time deposits, bank loans and security holdings, and the money supply. Test your understanding by considering these questions:

1. Why are all the multiples of minimum necessary contraction so much smaller than in Cases I and II?
2. Why is ΔL greater than $\Delta D + \Delta T$?
3. Why is ΔM greater than ΔD?
4. How do you know that the banks have contracted by the necessary minimum when they have contracted by the amounts calculated by you?

The General Case

We developed our analysis through three cases, both to proceed from the simplest to the more complex and also to emphasize the importance of the values of the variables in determining the sizes of the various multiples of maximum expansion and minimum necessary contraction. It should be clear, however, that the formulae used in Case III apply generally. Case I is simply the special case in which $n = 0$ and $s = 0$. Case II is the special case in which $s = 0$. Thus, the general formulas are

(1) $$\Delta D = \Delta A \frac{1}{r + nb + s}$$

(2) $$\Delta T = n\,\Delta D$$

(3) $$\Delta D + \Delta T = (1 + n)\,\Delta D$$

(4) $\Delta C = s\,\Delta D$

(5) $\Delta L = \Delta D + \Delta T + \Delta C = (1 + n + s)\,\Delta D$

(6) $\Delta M = \Delta D + \Delta C = (1 + s)\,\Delta D$

It should be remembered that this analysis assumes that the entire initial change in reserves represents a change in excess reserves, and the deposit multiples refer only to derivative deposits. When the initial change of reserves comes about through primary deposits, excess reserves change only by an amount equal to the initial change of reserves minus the additional reserve required against the primary deposit.

EXPANSION AND CONTRACTION BY AN INDIVIDUAL BANK IN THE SYSTEM

At several points in the preceding sections, we emphasized that we were dealing with multiple expansion or contraction by *the banking system as a whole* in response to an initial change in its reserves. The same analysis can be applied to an individual bank only with very important modifications. This is because an individual bank is subjected to "induced reserve losses" and "induced reserve gains" that do not apply to the banking system as a whole. An individual bank, like the banking system, may experience an induced drain of currency into circulation or an inflow of currency from circulation. In addition, however, the individual bank is subject to induced reserve losses to make net payments to other banks and to induced reserve gains as other banks make net payments to it. It is because of these induced reserve losses or gains through payments to, or receipts from, other banks that an individual bank receiving an initial increase of its reserves usually cannot expand its deposit liabilities and earning assets by a multiple and it need not contract its deposits and earning assets by a multiple because of an initial loss of reserves.

Expansion

To illustrate this, let us consider an individual bank, which we shall call "the first bank," and make the following assumptions:

1. The first bank receives a $10 million addition to its reserves through a primary deposit. This may, for example, result from an inflow of currency, or gold inflows, or a Federal Reserve purchase of securities from the public.
2. All proceeds of bank loans are held in demand deposits; there is no change in time deposits and no induced cash drain.
3. All banks operate under a reserve requirement of 20 percent.

The initial effects on the balance sheet of the first bank are these:

ASSETS	LIABILITIES
Reserves + \$10 million	Deposits + \$10 million
Addenda:	
Required reserves + \$2 million	
Excess reserves + \$8 million	

Now that it has \$8 million of excess reserves, can the first bank proceed to increase its loans and security holdings by \$8 million/0.20, or \$40 million? It could if all the derivative deposits remained with it. In this case, all initial increase of reserves would remain in the first bank, available to support additional derivative deposits. But this is most unlikely to occur in a system with more than 13,000 banks. It is much more likely that a large part of the derivative deposits will be checked out to other banks, thus requiring the first bank to transfer reserves and thereby reducing its ability to expand its own loans and security holdings. Table 5–1 shows the expansion for individual banks and for the banking system

TABLE 5–1. Deposit Expansion on New Reserves by a Banking System

	Additional Deposits Received	Additional Reserves Retained Against Deposits Received (20%)	Additional Loans Made (80%) [The deposits created by these loans are all checked out to the next bank.]
First bank	\$10,000,000	\$ 2,000,000	\$ 8,000,000
Second bank	8,000,000	1,600,000	6,400,000
Third bank	6,400,000	1,280,000	5,120,000
Fourth bank	5,120,000	1,024,000	4,096,000
Fifth bank	4,096,000	819,200	3,276,800
Sixth bank	3,276,000	655,360	2,621,440
Seventh bank	2,621,440	524,288	2,097,152
Eighth bank	2,097,152	419,430	1,677,722
Ninth bank	1,677,722	335,544	1,342,178
Tenth bank	1,342,178	268,436	1,073,742
Total, first ten banks	\$44,631,292	\$ 8,926,258	\$35,705,034
Other banks in turn	5,368,708	1,073,742	4,294,966
Grand total	\$50,000,000	\$10,000,000	\$40,000,000

SOURCE: Adapted from Board of Governors of the Federal Reserve System, *The Federal Reserve System—Its Purposes and Functions*, 1939, p. 73.

as a whole on the extreme assumption that *all* derivative deposits created by one bank are checked out to the next bank and that an equal amount of reserves must be paid over to the transferee bank.

After receiving the \$10 million addition to its deposits and reserves,

the first bank "sets aside" the $2 million of additional required reserves, and expands its loans and security holdings by $8 million. These loan-created deposits are checked out to the second bank and an equal amount of reserves transferred to it. (We know that, for the banking system, these are derivative deposits; but to the second bank they will appear as primary deposits, for they brought with them an equal amount of reserves.) The second bank "sets aside" the $1.6 million of required reserves (20% of $8 million) and expands its loans and security holdings by $6.4 million. The resulting derivative deposits and an equal amount of reserves are transferred to the third bank, which continues the expansion, as do the others in turn. Thus, the $50 million expansion of deposits in the system as a whole ($40 million of which was created by bank loans and security purchases) represents increases at many banks.

This example illustrates some important points:

1. Every individual banker could properly say, "I certainly didn't engage in multiple expansion. All I did was to accept deposits, set aside the required reserve, and then lend an amount equal to the remainder." Yet for the system as a whole, there was indeed a multiple expansion of deposits and earning assets, and most of the new deposits were derivative deposits.

2. Most of the expansion occurred not at the bank initially receiving the increase of reserves, but in other banks to which most of the reserves came to be transferred.

3. This illustrates the process through which initial injections of additional reserves in only one or a few banks can lead to increased reserves and credit expansion throughout the banking system.

Contraction

Using comparable assumptions, suppose that an individual bank, the first bank, loses $10 million of reserves through a withdrawal of currency. The process, results, and conclusions are symmetrical with those above. Table 5–1 can be used to illustrate this if the column headings are changed. Change the first column to read, "Decrease in deposits and reserves"; the second, to "Decrease of required reserves because of loss of deposits"; and the third to, "Decrease in loans (this is equal to 80 percent of deposits lost)."

Now that its reserves are deficient, the first bank will decrease its loans and security holdings, receive in payment checks drawn on the second bank, and gain reserves from the latter. The second bank will decrease its loans and security holdings, receive in payment checks on the third bank and gain reserves from it. And so the contraction process spreads and

continues until the system has contracted by the minimum amount required to repair the reserve position of its members.

In thinking about the amount of expansion or contraction following in initial change in reserves, it is essential to distinguish clearly between the results for an individual bank and for the banking system as a whole. Failure to do so has in the past led to muddled thinking and policy mistakes and to needless controversies between bankers and economists.

CONCLUSIONS

Several of the major points in this chapter will be essential in our later analysis, especially when we deal with monetary management by the Federal Reserve.

1. Each dollar of bank reserves is indeed "high-powered" money, capable of supporting several dollars of deposits. Thus, by creating an additional dollar of reserves for the banks, the Federal Reserve can enable them to create several dollars of bank credit. And by depriving the banks of a dollar of reserves, the Federal Reserve can force them to reduce bank credit by some multiple.

2. The volume of deposits and also of bank loans and holdings of securities that can be supported by each dollar of reserves depends greatly on the height of legally required reserve ratios. Thus, the Federal Reserve's power to increase and decrease reserve requirements is a potent instrument.

3. The Federal Reserve or any other central bank that wishes to forecast the size of the effects that will flow from its own actions must use the type of analysis presented in this chapter.

SELECTED READINGS

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6. Bank Assets and Their Management

Up to this point we have deliberately refrained from discussing in any detailed way the composition of bank assets. We did this to emphasize one important point: that the banks can create deposits and money by purchasing assets of any kind and can destroy deposits and money by selling any kind of asset. Now we shall examine more closely the role of banks as providers of loan funds, though the relation of this function to the behavior of the money supply should always be kept in mind. We shall consider questions such as these: What kinds of assets do commercial banks buy, hold, and sell, and in what proportions are these held? To what classes of users and for what types of purposes is bank credit made available? Through what channels do the banks inject or withdraw loan funds? What are the important relationships among the commercial banks and the various branches of the markets for savings and securities? As banks inject or withdraw funds, do they affect only a narrow segment of these markets, or are their effects widespread? How do banks readjust their portfolios as customer demands for loans rise or fall and as their total lending power increases or decreases?

It will be convenient to start with a general survey of the various types of bank assets. Table 6–1 shows these for all commercial banks on a recent date. It should be borne in mind that such large aggregates hide important differences among banks, but the proportions reflect a sort of weighted average.

SURVEY OF BANK ASSETS

Several types of assets are conspicuous for their absence or smallness. Outstanding in this respect are physical assets in the form of land, build-

ings, and equipment. Few banks own many assets of this type beyond those needed for banking purposes. Even smaller are bank holdings of common stock, and most of these are in the form of stock in the Federal

TABLE 6–1. Co Bank Assets, December 28, 1962
(amounts in millions)

	Amount	Percent of Total Assets
CASH IN VAULT	$ 4,252	1.6
DEPOSITS AT THE FEDERAL RESERVE	17,680	6.5
BALANCES WITH DOMESTIC BANKS	13,009	4.8
LOANS		
Commercial and industrial	48,673	17.8
Agricultural	7,097	2.6
For purchasing and carrying securities		
To brokers and dealers	5,114	1.9
To others	2,131	0.8
To financial institutions		
To banks	2,578	0.9
To others	8,459	3.1
Real estate	34,259	12.5
Other loans to individuals	30,553	11.1
Other loans	3,909	1.4
Total loans (gross)	$143,324	52.1
SECURITIES		
U.S. Government:		
Bills	$ 11,674	4.3
Certificates	3,932	1.4
Notes	23,841	8.7
Bonds	26,987	9.9
State and local government	24,755	9.0
Other securities	4,543	1.7
Total securities (gross)	95,732	35.0
TOTAL ASSETS	$273,476	100.0

SOURCE: *Federal Reserve Bulletin*, May, 1963, pp. 666–667.

Reserve banks, which member banks are required to hold. Currency and deposits at the Federal Reserve are larger, but are usually kept close to the minimum necessary to meet legal reserve requirments. Balances at other banks arise out of the system of correspondent banking relationships described earlier. Cash items in process of collection are kept to a minimum, for banks try to collect them and to receive payment in reserves as soon as possible.

The great bulk of bank assets, about 87 percent, is composed of loans and securities, which are debt claims against others. Table 6–1 suggests the great variety of these claims.

Commercial and Industrial Loans

Let us start with the type of loan that gave commercial banking its name. The commercial-loan theory of banking, which has been highly influential but never wholly accepted by either bankers or economists, holds that banks should confine themselves exclusively to this type of credit. They should make only short-term, self-liquidating loans based on the production, distribution, or sale of goods and services. The basic idea is that a bank should lend only on the basis of a specific transaction or process that is short-term in nature and which at its termination will provide the borrower with funds that he can use to pay off the loan. For example, it is held that a merchant may properly borrow to buy an inventory of merchandise that can be sold in a few months for enough money to retire the loan. Or a manufacturer may borrow to buy raw materials and components and to meet payrolls in order to turn out a product that can soon be sold and the proceeds used to pay off the loan. Or a farmer may properly borrow to finance the planting, tending, and marketing of a crop that will be sold in a few months. On the negative side, the commercial-loan theorists contend that banks should not make long-term loans and should not lend on the basis of a project or process that will bring in proceeds only over a long period. For example, a bank should not lend money to a merchant to buy a store, to a manufacturer to buy plant and durable equipment, or to a farmer to buy land. Most economists now reject the commercial loan theory, and few bankers are guided exclusively, or even largely, by it.

Some of the loans included in "commercial and industrial loans" in Table 6–1 conform to the commercial-loan theory, but many do not. For one thing, some are not short-term (they do not mature within a year), but are "term loans" that may run for three to five years or even longer. Perhaps more important, many of these loans, short-term as well as term loans, are not based on a specific transaction or process. Rather, they are based on the general credit rating of the borrower as reflected by his past and prospective income and expenses, the ratio of his assets to his total liabilities, and the ratio of his short-term assets to his short-term liabilities. A borrower whose rating in these respects is satisfactory may get a short-term or term loan from a bank without specifying any particular project, mix the proceeds with his other funds, and use the funds as

he sees fit, including perhaps the purchase of real estate or durable equipment.

The term "commercial banks" is appropriate in the sense that these institutions are by far the largest source of short-term, and even of term, commercial and industrial loans. In many areas and for many business firms, especially small and medium-sized firms, there is no other source of short-term loans that can compare in convenience, adequacy, and cheapness. But it remains true that these loans represent only a fraction of total commercial-bank credit.

Other Loans

Commercial banks constitute one of the largest sources of consumer credit, both installment and noninstallment. Banks extend much of this credit directly to consumers, but they also provide credit indirectly through sales finance companies, finance companies, and others who lend to consumers. They do this by lending directly to these institutions and by purchasing in the open market the short-term promissory notes that these institutions issue to get funds.

Some of the loans on real estate are short-term construction loans, which are paid off when a building is finished and sold. But most of them are long-term mortgages on farms, on residential properties, and less often on commercial and industrial properties. Banks feel justified in holding these long-term mortgages primarily because of their time and savings deposits.

Loans on securities are for various purposes, but have the common characteristics that securities are used as collateral. Some are a type of business loan to enable security dealers to carry inventories. For example, dealers in United States government securities have to carry large inventories relative to their net worth and borrow heavily for this purpose, usually on a very short-term basis. Banks are an important source of such credit and also lend to dealers who hold inventories of other types of securities. Loans to brokers are primarily for the account of the brokers' customers who buy securities "on margin." In effect, the broker gets a loan on the basis of the customer's securities and uses the proceeds to pay the sellers of the securities. Individuals and others sometimes borrow directly from banks on security collateral and clearly use the proceeds for "purchasing or carrying securities." But the proceeds from loans backed by securities are often used for other purposes, securities being used as collateral simply because the lending bank finds them acceptable. For example, you might pledge as collateral some shares of General Motors

and use the proceeds to buy a car, finance a marriage, or buy business inventory. In many cases, there is no relation between the nature of the collateral and the use of loan proceeds. This is well expressed in the observation, "I once knew a fellow who pawned his overcoat to buy beer."

We need not discuss the other types of bank loans to establish the fact that commercial banks lend to many types of borrowers, for widely varying lengths of time, on many bases, and for a wide variety of stated purposes.

U.S. Government Obligations

For many years commercial-bank holdings of debt claims against the federal government have exceeded bank claims against any other single type of debtor. Because we shall deal with them so often, we should note the names given to various types of promissory notes representing the federal debt. "Treasury bills" have the shortest original maturity. They used to run no more than three months, but some of the later issues have been longer, a few as long as a year and a half. They carry no "coupon" or stated interest; the holder receives income by purchasing them at a discount from the face value at which they will be paid at maturity. All other issues pay interest at a stated percentage of face value. "Certificates of indebtedness" usually have an initial maturity of 9 to 12 months, "Treasury notes" run one to five years, and "bonds" run five years or more. It should be noted that these are initial maturities. As time elapses, what were originally longer-term securities become shorter-term and are treated by banks and other investors as such.

The banks acquire some of these securities directly from the Treasury, and they sometimes dispose of these securities directly to the Treasury. But a larger part of the banks' transactions in these securities is not with the Treasury or the Federal Reserve but with other types of buyers and sellers. Federal obligations are held in large amounts by many types of holders: by mutual savings banks, savings and loan associations, insurance companies, other financial institutions, nonfinancial corporations, individuals, pension funds, state and local governments, foreign investors, and so on. All these buyers and sellers are interlinked in a national and even international market through a small group of government security dealers. These dealers maintain a continuous market by standing ready to buy and sell, exacting only a small gross margin. Thus, one can usually buy or sell any quantity that he wants very quickly and at small cost. And the prices of the shorter maturities vary only within narrow limits.

Owing both to the nature of the securities themselves and to the efficiency and cheapness of the market mechanism, these securities, and

especially Treasury bills and other short-term issues, have become a highly important instrument for adjusting cash, liquidity, and portfolio positions. We shall later see how commercial banks buy these securities when they have excess reserves or wish to shift funds from other uses, and how they sell these securities to repair reserve deficiencies or to get funds for other purposes. Other financial institutions and nonfinancial holders act in comparable ways.

Thus, net purchases or net sales of government securities by the banks do not necessarily supply money to the Treasury or withdraw money from it. When banks buy these securities from others, the result is to supply others with money, which they can use as they see fit. For example, when banks buy these securities from insurance companies or other financial institutions, these sellers are provided with money, which they can use to buy other types of assets, to pay debts, or to hold idle. When they buy securities from nonfinancial business firms, the latter can use the money to hire workers, buy inventory, construct plants, or for any other purpose. And when banks sell government securities to other financial institutions or others, they withdraw funds and reduce the amount of money available to the former holders. The banks may then use the funds to acquire other types of assets, or they may simply reduce the money supply.

Other Securities

Among the other types of securities held by commercial banks, obligations of the states and their subdivisions are by far the largest. Some of these are acquired directly from the issuers; others are acquired in the open market.

Conclusions

In this section we have stressed the variety of claims included in bank portfolios. Far from restricting themselves to short-term business loans, banks hold debt claims of widely varying maturities against other financial institutions, government at all levels, consumers, and others. Thus, they are involved in many branches of the markets for savings and financial claims and can bring about widespread effects as they expand or contract their credit.

Yet we must not overstate the point. We do find differences when we compare bank portfolios with those of other important financial institutions. Perhaps most obvious, they are on balance in shorter maturities. And they tend to be more liquid and less risky. Certainly they contrast sharply with mutual savings banks (which hold largely long-term mortgages and bonds), with mutual investment companies (which are

mostly in common stocks), and life insurance companies (which are largely in mortgages, long-term bonds, and some real estate and common stock).

Let us now look at some of the considerations that influence the portfolio policies of banks.

BANK EARNINGS, SAFETY, AND LIQUIDITY

As noted earlier, it would perhaps be misleading to state that a bank strives to maximize its profits, but probably even more misleading to state that it will deliberately deviate far or for long from this objective. But whether a bank aims at maximum profits or at some other profits target, it faces difficult problems in weighing profits now against profits in the future. Portfolio and other policies that would maximize immediate profits could lead to much lower profits—and even to losses—in the future by alienating customers, lowering confidence in the bank, and even inducing failure. On the other hand, some policies aimed at maximizing profits in the distant future could lead to quite unsatisfactory current profits or even to current losses. Banks undoubtedly differ in the ways they balance present against future profits, and the balance at an individual bank probably changes from time to time. Yet it is a rare bank indeed that concentrates solely on current profits to the complete neglect of the future. Most banks aspire to be continuing "going concerns" with prospects for a profitable future. It is partly for this reason that they are concerned with maintaining "adequate" safety and liquidity.

Safety of Assets

By the "safety" of an asset we mean simply the stability of its value through time. No bank would be disturbed by the "risk" that an asset would rise in value, but the risk of a price decline is a matter of real concern. As we found earlier, there are two principal sources of risk on a debt obligation: (1) the possibility that the debtor will not make the promised payments of interest and repayment of principal, and (2) the possibility that interest rates will rise, thereby lowering the capitalized value of the asset even if the debtor will meet all his obligations promptly. Thus, the estimated risk on an asset depends in part on expectations concerning the future course of interest rates. Some obligations that are considered quite safe when interest rates are expected to remain constant, or to fall, come to be considered risky when the prospects are for higher interest rates. This is especially true of long-term obligations.

The various types of debt claims available to banks differ greatly in

their degrees of safety and risk. To mention only two extremes, short-term claims against debtors of unquestioned credit-worthiness are far safer than long-term claims against debtors who may not be able to pay. Such differences in risk are usually accompanied by differences in promised rates of return, but it is often difficult to assess whether the interest differentials just compensate for risk differentials, more than compensate for them, or are inadequate to compensate for them. Each banker therefore faces difficult problems in determining the types and amounts of risk to assume. If he goes to the extreme of purchasing and holding only the safest assets, his earnings are likely to be very low. Moreover, he may fail to meet his customers' reasonable demands for loans, may get the reputation of being an undependable and inadequate source of credit, and may lose customers and their deposits to other banks. On the other hand, there are real dangers in assuming "too much" risk. For one thing, the bank may suffer such large losses on risky assets that their net return will be less than that on safer assets. Moreover, large losses, or even the prospect of such losses, can endanger the future of the bank.

Commercial banks are especially limited in their ability to assume risks because of the very high ratio of their fixed-dollar liabilities to their total assets. As noted earlier, the net worth of banks is equal to only about 9 percent of their total assets. The other 91 percent of claims are liabilities, mostly deposits, that are fixed in terms of dollars. Thus, if the assets of a bank with these ratios depreciated by more than 9 percent, the bank would be insolvent; the value of its assets would be less than its liabilities to depositors and others. The bank might have to be closed. But the bank may face serious consequences long before its assets depreciate enough to wipe out its net worth and make it insolvent. As its net worth shrinks, depositors may become distrustful, and the bank may face serious problems in attracting deposits and even in retaining existing deposits. This has obvious deleterious effects on the bank's lending power.

A bank can attempt to maintain an adequate degree of solvency in two different ways: (1) by increasing its net worth and (2) by maintaining safety of its assets. One way to increase net worth is to retain profits. This method has obvious limitations. If profits are low, net worth can be built up only slowly even if the bank pays no dividends to shareholders. And to the extent that a bank reduces dividends in order to retain earnings, it may depress the market price of its outstanding shares. The bank may also increase its net worth by selling additional stock. As it does this, it may feel justified in acquiring a larger proportion of risky assets, thereby increasing its earnings. But there is a limit to the extent that this can be done profitably. Experience indicates that banks can achieve a profit rate

on net worth comparable to profit rates in other industries only if they have a large "leverage factor"; that is, only if total earning assets are a large multiple of net worth. At some stage, therefore, a bank finds it unprofitable to expand further its net worth relative to its assets. It must therefore limit the amount of risk that it assumes.

Thus, in determining the composition of his portfolio, a banker faces difficult problems in balancing safety against earnings. He must estimate the amounts of risks attached to the various types of available assets, compare estimated risk differentials against interest differentials, consider both long-run and short-run consequences, and strike a balance. If he veers too far toward safety, he may face not only inadequate profits in the short-run but also charges that his aversion to risk prevents him from serving adequately the needs of his customers and the economy. But if he veers too far in the direction of risk bearing, he may face disaster or at least endanger his ability to attract or even to retain deposits. He must also keep in mind his need for liquidity, a problem to which we now turn.

Bank Liquidity

By the "liquidity" of a bank is meant its capacity to meet promptly demands that it pay its obligations. As noted earlier, commercial banks must pay more attention to liquidity than must many other types of financial institutions, such as life insurance companies. This results from the very high ratio of their debt liabilities to their total assets and also from the very short-term nature of these debt liabilities, demand deposits being payable immediately on demand and time and savings deposits on short notice. Modern banks operate on the assumption that neither all their deposits nor even a large proportion of them will be withdrawn at any one time or over any short period. Nevertheless, each bank must be prepared to make net payments of two types: (1) to meet net withdrawals of currency into circulation, and (2) to cover adverse clearing balances with other banks. Some of these are of such a regular seasonal or other cyclical nature that they can be predicted with fair accuracy and prepared against. Others are more erratic and less predictable. Inability to meet these drains promptly means failure or at least an impairment of confidence in the bank.

A bank could, of course, elect to "play it safe" and remain completely liquid by holding cash equal to all its liabilities. But the effects on its income would be disastrous. With earning assets equal only to its net worth, the bank's gross income would not even cover its expenses. At the other extreme, the bank could select assets solely with an eye to income,

ignoring liquidity. This, too, can lead to disaster, perhaps to sudden death rather than slow starvation. Thus, in determining *its portfolio composition, a bank must balance its desire for income against its desire for liquidity.* And it usually tries to buy any given amount of liquidity at the lowest possible cost in terms of sacrifice of net earnings. An individual bank has two principal sources of liquidity: borrowings from others and sales out of its asset holdings.

How much liquidity a bank will seek in its asset holdings depends in part on the availability and cost of borrowings. If a bank is assured that it can at any time borrow large amounts without onus and at a low interest cost relative to yields on its assets, it may rely largely on this source for liquidity and hold few liquid assets. But if the availability of borrowings is uncertain, or if borrowing carries an onus, or if borrowing costs are high relative to yields on the bank's assets, the bank will seek more liquidity in its asset portfolio. There is a tradition among American banks against large and continuous borrowing, this being considered unsound. Perhaps this is because banks already owe their depositors so much that still further additions to their debts would be too risky. Yet banks do sometimes borrow fairly large amounts for limited periods.

One source of loans to banks is the Federal Reserve. The latter rarely refuses to lend to a bank with deficient reserves, but it makes no secret of the fact that this source should be used sparingly. It emphasizes that borrowing is a privilege and not a right, reminds banks of the tradition against continuous borrowing, uses moral suasion to discourage borrowing and encourage repayment, and sometimes raises its discount rate to make borrowing more expensive. Banks may also borrow from other sources. One is through the "Federal funds market." This is a market, usually operating through brokers or other middlemen, in which banks with reserves in excess of legal requirements can lend them to banks who need to repair their reserve positions or to make net payments. These are "one-day loans," but they may be renewed if both borrower and lender agree. Banks also borrow directly from other banks and sometimes from other lenders, such as large nonfinancial corporations.

For various reasons (such as fear that they will not be able to borrow, the tradition against continuous borrowing, and fear that borrowing will be expensive), banks hold some fraction of their asset portfolios in forms that are highly liquid.

By the "liquidity" of an asset we mean its capability of being exchanged for money at a stable value, quickly, and at a low cost of disposal. Money itself is completely stable and it is available for immediate use without any conversion cost. Other assets are liquid to the extent that they share

these attributes. The liquidity of an asset depends partly on the nature of the asset itself and partly on institutional arrangements in the market. Thus, very short-term claims against debtors of unquestioned credit rating tend to be more liquid than longer-term claims with more doubtful credit ratings. Securities for which there is a highly organized, efficient market are more liquid than those for which no such market facilities exist.

Available to banks are many types of assets with varying degrees of liquidity. Among the most liquid are cash in vault; deposits at the Federal Reserve; deposits at other banks; demand or call loans to other banks, brokers, dealers in government securities, and others; Treasury bills and other short-term obligations of the federal government; acceptances; and open-market commercial paper issued by large firms of unquestioned credit rating. Among the less liquid are loans to customers, longer-term bonds, and mortgages. Generally speaking, the higher the degree of liquidity, the lower the yield on an asset. Holders are willing to forego some yield to buy liquidity, and they demand more income to offset illiquidity. Each banker therefore faces the problem of balancing his desire for income against his desire for liquidity. His demand curve for liquidity is usually downward sloping. Some liquidity is so important that he will, if necessary, sacrifice large amounts of income to buy it. He will buy further amounts only if the cost is lower. But he will always try to buy liquidity at the lowest possible cost in terms of foregone earnings.

We have already noted that legally required reserves are not an important source of liquidity to banks. Cash in vault and deposits at the Federal Reserve, which banks are legally required to hold, are not available to make payments to others. Only reserves in excess of legal requirements are available for this purpose. But even legally required reserves can supply liquidity for a few days. This is because a bank need not meet its legal reserve requirements every day but only on the average over a "reserve period." For member banks located in reserve cities, the largest cities, the reserve period is one week. For member banks located elsewhere, the "country banks," the reserve period is two weeks. Thus, a bank can indeed use some of its legally required reserves to make net payments for a few days in a reserve period. But if it does so, it must balance out by holding reserves in excess of requirements during the remainder of the period, and to acquire these reserves it must have other sources of liquidity.

Suppose a bank must make payments, either as currency for circulation or as payments to other banks, because of a net loss of deposits. It can finance these payments out of its legally required reserves only to

extent that the amount of its required reserves is thereby reduced, which is equal to the loss of deposits times its required reserve ratio. For example, if this ratio is 15 percent, each dollar loss of deposits will reduce required reserves only 15 cents and will free only this amount for payments. The other 85 cents must come from other sources, and the lower the required reserve ratio, the larger the proportion of funds needed for payment that must come from other sources.

A bank could, of course, hold liquidity in the form of cash in vault and deposits at the Federal Reserve in excess of legal requirements. Or it could hold large amounts of deposits at other banks. These highly liquid assets have one serious disadvantage: They yield no income. Bankers are therefore impelled to hold a major part of their liquidity in the form of liquid assets that yield an income.

It should not be assumed that the ratio of liquid assets to total bank assets remains constant. For example, banks may maintain a high degree of liquidity if yields on liquid assets are almost as high as those on more illiquid assets, and they may become less liquid if yields on liquid assets are relatively much lower. They may also allow their liquidity to decline in order to satisfy an upsurge of customer loan demands.

OPEN-MARKET AND CUSTOMER RELATIONSHIPS

As a further step in explaining the behavior of bank portfolios, it will be useful to distinguish between customer loans and earning assets acquired and sold in the "open market." As do most classifications, this one presents troublesome borderline cases, but it does highlight some motivations and market differences that strongly influence a banker's decisions relative to his portfolio.

The very term, "customer," suggests a relationship that is customarily of a continuing nature and that at least one of the parties involved would be reluctant to break. "Open market" suggests a quite different sort of relationship: impersonal, not necessarily continuing, and "open to all comers."

Open-Market Assets

The clearest examples of open-market relationships are those in which the bank that buys or sells a debt claim does not deal directly with the ultimate debtor. Thus, a bank may buy or sell, through a broker or dealer, United States government securities, state and municipal obligations, acceptances, open-market commercial paper, brokers loans, and so on. In many cases, the banker knows the debtor only by reputation, and the debtor does not know who holds the claims against him.

Open-market relationships usually have the following characteristics:

1. The bank decides whether to buy or sell a particular debt claim solely on the basis of the asset's attractiveness relative to other available open-market assets, and is not influenced by considerations concerning other possible relations with the debtor. For example, it does not assume that by purchasing a particular debt claim, it will attract deposits from the debtor.

2. The bank is not impelled to buy or is not constrained from selling a particular debt claim by any feeling of "loyalty" or "responsibility" to the debtor.

3. The individual bank has no significant monopoly power in the open market as a whole, or even in the market for the particular type of debt claim. From the individual banker's point of view, conditions in the open market approach the "purely competitive." Each bank controls only such a small part of the total demand that its own actions in buying or selling an open-market asset is assumed to have no significant effect on the price of the asset. Each banker assumes that he can buy or sell as much of the asset as he wishes at the going price.

This is not to say that conditions in the open market conform completely to those required for pure competition. But they come much closer than do conditions in customer loan markets.

Customer Loans

Relations between a bank and its borrowing customers are quite different in several respects. For one thing, the lender-borrower relationship is intertwined with other bank-customer relationships. The customer usually holds checking deposits, and sometimes time deposits, at the bank, and he may also be a customer of the trust or foreign exchange departments. The customer is made fully aware that the amount of loans that he can get depends in part on the bank's experience with him as a depositor. And the banker is equally aware that the amount of deposits that he can attract and retain, and therefore his lending power, depends in part on his reputation for "taking care of the legitimate credit needs of customers," even in periods of credit tightness. This is important partly because of the limited degree of price competition among banks in a local market. Banks are legally prohibited from paying interests on demand deposits, and they are reluctant to compete aggressively on rates paid on time deposits and charged on loans. Where price competition is thus restricted, nonprice competition comes to the fore. This takes many forms: reputation for soundness, convenience of location, decor, courtesy, and so on. Not the least of these is the bank's reliability as a loan

source. The advertising slogan, "You have a friend at Chase Manhattan," referred to a loan officer, but it was not meant to be ignored by potential depositors.

As already implied, there are many imperfections of competition in customer loan markets, and each bank has some degree of monopoly power relative to its customers. The amount of this power depends on many things, including the nature of the customer. No bank may have much monopoly power relative to a huge corporation of well known credit rating that has access to banks all over the country and can easily secure funds by selling short- or long-term claims in the open market. At the other extreme is the small firm that is virtually unknown to any bank other than its own.

To illustrate our points, let us consider the intermediate case of a small or medium-sized business firm that is a good credit risk but whose credit rating is not widely known. Such a firm finds it costly and inconvenient to shift its banking business to distant banks. To hold all its deposits at distant banks is possible but usually costly in time and convenience. To borrow at distant banks is even more costly, even when possible, because of the time and expense incurred by those banks in investigating his credit worthiness. Thus, there are strong forces tending to confine the firm's borrowing to banks in its own area, but as it surveys the local banking structure, the firm finds a situation of banking oligopoly (few sellers) of customer credit. There are only a few local banks, all charging about the same rate of interest, and afraid to compete aggressively for loans by lowering interest rates. Each bank knows that a rate cut by it would soon be followed by the others, so it would gain a differential advantage for no more than a short period. If the firm tries to "shop around" at the various banks, it is likely to meet responses of this sort: "Why don't you borrow at your own bank, where you do your other banking business? They know you, understand your credit needs, and are in a position to take care of you. It isn't sound policy to change frequently from one bank to another. Of course, if you decide to switch banks and bring all your banking business here, we can talk about the loan. Our first obligation is to meet the borrowing needs of our own customers."

For reasons such as these, a customer typically does not find it easy or costless to borrow from banks other than his own. This imperfection of competition gives each bank some degree of monopoly power over its customers. But the attachment of customers to other banks works to the disadvantage of a given bank, for that bank finds it harder to attract the business of those customers.

Summary

Such differences between conditions in the open market and those in customer loan markets help to explain several important things. For one thing, they help explain differences in the behavior of interest rates and yields in the two branches of the market. Like prices in most other highly competitive markets, interest rates in the open market change frequently and quickly in response to changes in demand-supply relations. They often change every day and even several times during a day. In contrast, rates on customer loans change less frequently and more slowly. Like other "administered prices," they often go unchanged for a considerable period, even though supply-demand relationships have clearly changed.

The basic rate on bank loans to customers is the "prime rate." This is the rate charged to "prime" customers, usually very large customers with unquestioned credit rating and a favorable competitive position. Rates to other customers range upward from the prime rate, those to customers who are almost "prime" being only a little higher, and so on. The prime rate is changed only infrequently and usually only after pressure for change has accumulated. For example, suppose bank lending power is increased markedly relative to the demand for customer loans. Instead of lowering the prime rate quickly, banks seek to expand their credit in other ways. For one thing, they increase their holdings of open-market paper. In the customer loan market they become more generous in meeting loan requests, give some nonprime customers rates closer to the prime rate, and so on. Only after a delay, when downward pressures have already lowered rates in the open market, do they lower the prime rate. Suppose, on the other hand, that the supply of credit is decreased relative to the demand for it and that this is reflected in rate increases in the open market. Here again, banks may delay in raising the prime rate, perhaps partly because each bank fears that if it raises the rate, other banks will not follow suit. For some time they ration loans to customers, not by raising the interest rate, but by scaling down loan requests and otherwise limiting the availability of credit. Only after pressures for increases of rates have accumulated and open-market rates have already risen is the prime rate increased.

Differences in conditions in the open market and in customer's loan markets also help to explain why, other things equal, a bank is likely to prefer customers' loans over assets acquired in the open market. For one thing, a given initial amount of excess reserves is likely to enable a bank to lend more to customers than it could lend in the open market. If a bank lends in the open market, the entire amount of the loan is likely to be deposited in other banks, thereby draining off an equal amount of

reserves. But if the bank lends to customers, some of the proceeds are likely to be kept on deposit with it, thereby lessening its loss of reserves. Customers may hold some of the deposits voluntarily. The lending bank also has ways of encouraging the customer to do so. For example, it may require "compensating deposit balances" from its borrowers, and let them know that the availability of loans will depend on the amount of their deposits.

Perhaps more important, a banker knows that his total lending power is not independent of his lending policies to customers. If he acquires a reputation of meeting all reasonable loan demands of customers, he will be able to attract and retain more deposits, and thus to lend more. But if he becomes known as a banker who is niggardly in meeting customers' needs, he will be able to attract and retain only a smaller volume of deposits, and his total lending power will shrink. The extent to which this consideration will influence the composition of a bank's portfolio depends in part on the size of customers' loan demands relative to the total lending power of the bank. If customers' demands are relatively small, the bank can feel free to hold a large fraction of its portfolio in open-market assets. But if customers' demands for loans are very large relative to its total lending power, the bank is under heavy pressures to hold most of its portfolio in this form. The extent of these pressures vary from bank to bank, and they can also change markedly at a given bank as customers' loan demands rise and fall.

Thus, other things equal, a bank is strongly impelled to meet customers' loan demands rather than acquire open-market assets. But other things, such as interest rates and degrees of safety and liquidity, may not be equal. For example, open-market assets may be safer, or more liquid, or higher yielding. The bank's desire to make customer loans must therefore be balanced against its demand for safety, liquidity, and in some cases earnings.

COMPOSITION OF BANK PORTFOLIOS

Let us now draw all these things together and see how they are related to the composition of commercial bank assets and especially to the composition of earning assets in the banks' portfolios. One purpose is to see how and on what bases an individual bank determines its portfolio composition. Another is to see how the combined decisions of all the banks affect the supplies of credit and the behavior of interest rates in the various branches of the money market. The commercial banking system does not alone determine conditions in these markets. Conditions

the reduction of deposits reduces the required reserves of banks enough to enable them to expand their customers' loans by an equal amount. For example, if the public surrenders $100 million of deposits to pay for Treasury bills purchased from the banks, this reduces the banks' required reserve and adds to excess reserves enough to enable the banks to increase customers' loans by $100 million.

In some cases, this is merely a way of channeling some of the nation's current saving into loans to bank customers. For example, the public uses some of its current saving to buy Treasury bills from the banks, and the banks lend to customers. In other cases, it may be a way of "activating idle deposits." A buyer pays for a Treasury bill by relinquishing a deposit that he would otherwise have held idle. This lowers the banks' required reserves and creates excess reserves, and the banks are thereby enabled to increase their customers' loans. A newly created "active deposit" replaces the old "idle deposit," but, in any case, bank sales of open-market assets tend to raise interest rates in the open market, which represents an increase in the cost of acquiring funds to lend to customers. Banks are thereby impelled to raise interest rates on customer loans, though perhaps only after a delay.

Thus, the banks do indeed increase the proportion of customers' loans in their portfolios in response to marked increases in customers' demands for loans. But as the process continues, the banks become increasingly reluctant to make further increases in their loans to customers. This is because of the impairment of their liquidity and perhaps also their safety. They become less liquid as they increase their borrowings and sell off their most liquid assets. And they become less safe to the extent that customers' loans are riskier than the assets sold. The banks may seek to reduce the impairment of their liquidity and safety by selling off not their most liquid and safe assets but some of their longer-term, riskier, open-market assets such as long-term bonds. This usually involves capital losses, for the rise of interest rates will have lowered the market prices of longer-term securities. Increasingly, therefore, banks will resist further increases of customers loans. They will ration loans to some extent by raising interest rates. They may also reduce the availability of credit by nonprice rationing methods, that is, by trying to convince customers that they should reduce their loan requests, by granting only a fraction of the loans requested, and by outright denial of loan applications.

Increase in Bank Reserves

Suppose now that the Federal Reserve provides banks with a considerable amount of additional reserves at a time when customers' loan de-

mands are not rising and may be falling. The immediate effect is to increase bank liquidity in the form of excess reserves, which yield no income. These funds may be used for three purposes: to pay off bank borrowings from the Federal Reserve and others, to purchase open-market assets, and to expand loans to customers. How the funds will be distributed among these uses will depend on existing conditions, such as the liquidity of the banks and the amount of unsatisfied demands for customers' loans. If the banks have been rationing loans, they may relax their restrictions and expand customers' loans at an early stage. But they are most unlikely to lower interest rates on these loans at an early stage. Rather, they will pay off borrowings and purchase assets in the open market, and especially highly liquid assets. As they do this, interest rates in the open market will fall. At first, the decline of interest rates may be largely limited to short-term maturities, but, as these yields decline relative to yields on longer-term obligations, both banks and other buyers will be impelled to switch their purchases to the longer maturities, thereby tending to lower their yields.

Thus, the initial response of banks to an increase of their excess reserves may be to purchase assets in the open market and to lower interest rates there. But, as the banks become more liquid and face lower yields in the open market, they will try to expand their loans to customers. At first they may try to do this solely by relaxing restrictions and encouraging customers to borrow, but at some stage, interest rates on customers' loans will be reduced.

CONCLUSIONS

These two examples illustrate some of the forces that influence the composition of bank portfolios. We shall discuss more of these later in connection with Federal-Reserve policies.

7. United States Banking History

No one can understand fully the present structure of the United States commercial banking system, banking practices and policies, and public attitudes toward banking without some knowledge of the nation's banking history. To bring out some of the major events in our banking history, we shall divide it into three main periods: (1) from 1781 to the establishment of the National Banking System in 1863; (2) from 1863 to the establishment of the Federal Reserve System in 1914; and (3) since 1914. Each of these periods will be further subdivided for more detailed analysis.

BANKING FROM 1781 TO 1863

In banking, as in most other aspects of American life, this early period from 1781 to 1863 was one of rapid development and widespread controversy. Having gained its independence, the new nation was struggling to determine its social, political, economic, and financial patterns. On all these matters, there were important differences of opinion. By far the largest part of the population lived on farms, most of which were largely self-sufficient, all except a few of the cities were small, manufacturing was still in its infancy, and trade occupied a far less important position than it does today. The nation had virtually no experience with banking of modern types, and there were wide disagreements concerning the contributions that banks could make. Some were perhaps too laudatory, overestimating the extent to which banks could stimulate capital formation and promote productivity and trade by providing credit and a more generous supply of money in the form of bank notes and deposits. Others denied that banks were productive at all; instead, they insisted that banks merely lowered the quality of the nation's money because issues of bank notes and deposits drove out, or kept out, an equal value

of good metallic coins. Alexander Hamilton and others who shared his goal of developing an industrial and commercial type of economy were generally favorably disposed toward banking, believing that banks were an essential part of such an economy. Thomas Jefferson and his sympathizers, who believed that the country should remain largely agricultural, were generally opposed to banks, at least partly because banking was closely related to industry and commerce. The Federalists and others who favored centralization of political power believed that the power to charter and supervise banks should be exclusively federal. They questioned the constitutionality of state activities in this field. On the other hand, the anti-Federalists and their friends, who opposed centralization of political power and championed states' rights, insisted that only the states had the power to create and supervise banks and that such federal activities were unconstitutional. Much of the banking controversy of the period is understandable only as a part of the broader controversy over industrialization versus agrarianism and centralization of political power versus states' rights.

It is also important to remember that bank notes were more important than deposits as means of payment until about the time of the Civil War. Checking deposits were used, especially in the cities, but they were not well suited to a predominantly agricultural country with few towns and slow travel and communication. In fact, during the Colonial period, the word *bank* meant "a batch of paper money." The first bank of a modern type in this country was the Bank of North America, which was established in Philadelphia in 1782 to aid in financing the Revolutionary War. The Bank of New York and the Bank of Massachusetts were established in 1784. These three were the only incorporated banks in the United States in 1790. There were, however, a few unincorporated or private banks, for under the common law everyone had a right to engage in banking as well as in other types of business. Only later, after 1800, did the states begin to limit banking by unincorporated firms.

The First Bank of the United States, 1791–1811

This bank, the first to be authorized by the federal government, received a 20-year charter in 1791. It had a capital stock of $10 million, of which $2 million was subscribed by the federal government with funds borrowed from the bank; the remainder was subscribed by private individuals, some of them residents of foreign countries. By today's standards it was a small bank; in its day it was huge. It was not only by far the largest bank of its day, but also the largest corporation in America. It established its head office in Philadelphia and branches in the other

principal cities of the country: Boston, New York, Baltimore, Norfolk, Charleston, Savannah, and New Orleans. It was, in fact, a nation-wide bank. Thus, the first federally chartered bank was a nation-wide branch bank jointly owned by the federal government and private investors.

The bank made loans and purchased securities; issued both deposits and bank notes; transferred loan funds and payments from one end of the country to the other; and performed useful functions for the government in lending to it, acting as its depository, and transferring funds for it. It also performed some central banking functions, for it regulated the lending and note-issuing powers of state banks. As the largest bank in the system, its own lending policies greatly affected the reserves of other banks. When it expanded its loans, some of the proceeds flowed to other banks, thereby augmenting their reserves in the form of deposits at the First Bank, or gold and silver specie. When the First Bank contracted its loans, it drained reserves from the other banks and limited their lending ability. It could greatly affect their specie reserves and lending power by its disposal of their bank notes that came into its possession. By simply holding these notes or paying them out into circulation, it could permit the banks to retain their specie reserves. But by presenting their notes to the issuing banks for redemption, the First Bank could decrease their specie reserves. It was in the exercise of its central banking power, and especially in limiting the loans and note issues of state banks, that the First Bank made some of its bitterest enemies.

The First Bank seems to have functioned well, especially so when compared with other banks during the first half of the nineteenth century. Nevertheless, Congress refused to renew its charter when it expired in 1811. Several arguments against recharter were advanced:

1. Much of the bank stock was owned by foreigners. Some people feared that foreigners would exercise excessive control over our economy through the bank, though foreign stockholders had no vote, and they also argued that money was drained out of the country by the payment of dividends to foreign stockholders.

2. Only "hard money" was good money. A large part of the community was still opposed to paper money of any sort, whether issued by banks or by government.

3. The bank was unconstitutional. The Constitution contained no express provision for bank charters. The anti-Federalists contended that no such power was even implied and hence the bank had been unconstitutional from the beginning. Moreover, they feared that it would tend to centralize power in the federal government at the expense of

the states, as its foremost proponent, Alexander Hamilton, hoped it would. It was frequently charged, apparently with some justice, that the bank was dominated by Federalists and that it discriminated against anti-Federalists in making loans.

4. The bank discouraged the growth of state banks. That is curbed the issue of state bank notes by presenting them regularly for redemption is clear. Some elements of the community, including the owners and officers of state banks as well as other proponents of "easy money," wanted to eliminate the curbing effects of the bank. But whatever the deciding motives of Congress in refusing its recharter, the First Bank of the United States expired in 1811.

State Banking, 1811–1816

Freed from the restraining influence of the First Bank and favored by inflationary financing of the War of 1812, state banks went on a spree. They grew in number from 88 in 1811 to 246 in 1816, and their note issues rose from $45 million in 1812 to at least $100 million in 1817. Virtually all ceased to redeem their notes in gold or silver, and their notes depreciated by varying amounts; the notes of many banks became virtually worthless. All the banking abuses that we shall study later appeared during this period. It was largely because of these gross abuses of the banking privilege by state banks and because of the extreme disorder of the monetary system that the Second Bank of the United States was established in 1816.

The Second Bank of the United States

The Second Bank of the United States received a 20-year charter from the federal government in 1816. In many respects it resembled the First Bank, but it was much larger and some of its charter provisions were different. Its capital was fixed at $35 million, of which one-fifth was to be subscribed by the federal government and paid for with its bonds. The remaining $28 million was subscribed by individuals, corporations, companies, and states, no one of whom was permitted to subscribe more than $300,000. At least one-fourth of these private subscriptions had to be paid in gold or silver; the remaining three-fourths could be paid in either specie or securities of the federal government. The bank was governed by a board of directors, of whom 5 were appointed by the President of the United States and 20 were elected by the private stockholders. The amount of property that the bank could hold was limited to $55 million, and its debts, excluding deposits but including bank notes, were

limited to $35 million. These limitations did not prevent the bank from being a giant institution as compared with other firms of the period. It established 25 branches to serve all the settled parts of the country.

Like the First Bank, the Second Bank performed both commercial and central banking functions. As a commercial bank, it lent to individuals, business firms, states, and the federal government; it accepted deposits from individuals and business firms as well as from governmental units; it issued bank notes; it transferred funds from one area to another; and it engaged in foreign-exchange operations. It also performed various functions that are usually entrusted to a central bank. It held government deposits, acted as fiscal agent of the government, and transferred funds from area to area for government account. Moreover, it acted as a regulator of state banks, presenting their notes for redemption, insisting that they redeem their obligations promptly in specie, and limiting in general the amount of credit they created. This was one of the principal purposes for which the Second Bank was created.

By 1833, the Second Bank had become so unpopular with President Andrew Jackson and many of the Jacksonian Democrats that federal deposits were withdrawn from it and placed with selected state banks, and its charter was not renewed on its expiration in 1836. The country was to see no more federally chartered banks until 1863 and was not to have another central banking system until 1914.

To evaluate the success of the Second Bank and the wisdom of Jackson's action in abolishing it is still a difficult task, for most of the contemporary discussions were rabidly partisan, and even some present-day writers are inclined to be apologists for either the bank or Jackson. We shall, however, note some of the reasons for the refusal to recharter the bank. No special attention will be given to charges that it was grossly mismanaged. It is true that mismanagement did appear in its early years and that later the bank performed some of its functions unwisely, or at least clumsily. But the principal objections to it came from deeper sources.

1. Unconstitutionality. Although the power of the strict constructionists had diminished greatly, critics of the bank again alleged that the federal government had no constitutional power to charter a bank. It is unlikely, however, that these people would have raised the question of constitutionality if they had not opposed the bank on other grounds.

2. Opposition to Paper Money. "Hard-money" men such as Senator Benton opposed paper money of any kind and favored the exclusive use of gold and silver coin. They denied that banks could increase the total quantity of money in a country or that they could "quicken trade,'

and insisted that bank money merely drove out of circulation an equivalent amount of gold and silver.

3. Opposition by State Banks. State banks, especially those that wanted to follow liberal lending and note-issue policies, were much opposed to the Second Bank. In the first place, the bank brought pressure on them to keep their notes redeemable in specie and to limit the quantity of their notes to the amount that they could redeem at par. This had the obvious effect of limiting state bank earnings. In the second place, the Second Bank competed with state banks in making loans; not only did it take loan business away from state banks, but it also reduced interest rates in some areas, for its discount rate was limited to 6 percent. And in the third place, some state banks, especially those in New York, wanted the large volume of federal government deposits that the Second Bank enjoyed. This opposition by state banks was a potent factor in the Second Bank's undoing.

4. Opposition by Others Who Favored Easy-Money Policies. Realizing that the Second Bank tended to restrict the total amount of money created and the total volume of loans extended by banks, many businessmen, landowners, potential land speculators, and others who felt they would benefit by easier money worked for the abolition of the bank.

5. Opposition to the Concentration of Financial and Economic Power. We have already mentioned that the Second Bank was a giant institution during the period in which it operated. It held about a third of all the banking assets of the country and was probably larger than any other business firm. Its critics insisted that a free people could ill afford to grant such power to any small group, for with this financial power went the ability to determine the life and death of banks and other business enterprises, the level of employment and prosperity, and even the political freedom of the people. Such critics repeatedly asserted that concentration of economic power in the hands of a few was incompatible with political democracy.

6. Political Activity by the Bank. Although some attempts were made to secure members of both political parties as directors and officers of the bank, it was well known that the large majority of those in control were opposed to Jackson and his party. Moreover, some of these men were aggressive in their political activities. It is difficult to discover the extent to which the bank's officers took the political initiative and to what extent their activities were merely defenses against earlier attacks on the bank. But it seems certain that the bank did enter the political arena and that at least some of its branch managers used their lending power to influence votes. The fate of the bank was sealed when its presi-

dent, Nicholas Biddle, openly but vainly opposed Jackson's re-election in 1832 and made the recharter of the bank one of the principal issues of the presidential campaign. A diplomatic president of the Second Bank might have been able to arrive at a satisfactory *modus vivendi* with the choleric President Jackson. But Biddle was not such a man. "Nicholas Biddle was a man of intense energy, autocratic in temper, and possessing supreme confidence in his own judgment. It was inevitable that he should rule and not merely reign, and the proofs that he did rule are observable everywhere."[1] The inevitable clash between Biddle and Jackson may have altered the entire course of our banking history.

Was President Jackson right in refusing to recharter the Second Bank in 1836? A full answer to this question would require far more space than we can devote to it. Two facts now seem clear, however. In the first place, it is questionable public policy to grant central banking powers to a corporation which is largely owned and controlled by private individuals and corporations, which is operated by its owners primarily for profit, and which as a profit-seeking enterprise has interests in conflict with those of the banks that it regulates. We now recognize that central banking is a governmental function that can be properly exercised only by institutions whose primary motive is not profits but financial and economic stabilization. A properly managed central bank must often follow policies that will decrease its profits. In the second place, however, it is quite clear that the abolition of the Second Bank without establishing another institution to take over its functions was a major blunder. It ushered in a generation of banking anarchy and monetary disorder.

State Banking, 1836–1863

From the lapse of the Second Bank's charter in 1836 until the establishment of the National Banking System in 1863, our banking system was made up exclusively of private (unincorporated) banks and of banks operating under corporate charters granted by the various states. We shall not discuss the unincorporated banks except to say that, as a group, they seem to have been neither significantly better nor significantly worse than the incorporated banks as a group. The incorporated banks, operating under widely diverse state laws, varied from good to very bad. Some performed their functions satisfactorily, especially toward the end of the period. At the other extreme, many engaged in practically all the banking abuses known to man.

Prior to 1837, a bank could secure a corporate charter from a state only

[1] Davis R. Dewey, *The Second Bank of the United States*, Senate Document No. 571, Washington, D.C., U.S. Government Printing Office, 1912, p. 263.

by a special legislative act. This method of granting bank charters gradually fell into disfavor for several reasons. It injected banks into politics and politics into banks. Loyal members of the political party in power might receive a bank charter, whereas members of the minority party had little chance of success. The controversy over bank charters threatened to corrupt state governments. Legislators were offered large sums of money to grant new charters and other large sums by existing banks to reject the applications of potential competitors. Furthermore, this method of granting charters often gave monopoly power to the favored banks. This was considered objectionable, both because of its alleged unfairness to those who wished to become bankers and because it was believed to restrict the total amount of credit granted, thereby impeding the economic expansion of the country.

To remedy this situation, Michigan in 1837 and New York in 1838 enacted "free banking laws." Most of the other states later enacted laws of the same general type. These laws ended the practice of granting charters by special legislative act and provided that anyone might secure a corporate charter and engage in banking by complying with the provisions of a general bank incorporation law. Banking was made "free" to all enterprisers who met the specified general requirements. The quality of state banks came to depend upon the appropriateness of these general requirements and upon the effectiveness with which they were enforced. In some states, the requirements were strict; banks could issue notes only by depositing with a state official an equivalent amount of high quality bonds and by meeting adequate capital and reserve requirements. But in the majority of states, the collateral requirements for notes were hopelessly inadequate, and capital and reserve requirements were virtually meaningless.

The relationships between banks and the states varied widely. At one extreme, the banks merely received their charters from the state; they secured all their capital from private sources and made any loans that were permitted within the broad framework of the banking laws. At the other extreme, many banks were wholly owned and operated by states. There were all sorts of variations between these two extremes. Thus, some banks were owned jointly by a state and private investors. Others had to pay large sums to the state for the privilege of banking. And still others were permitted to act as banks only if they would lend stipulated amounts to canal companies, railroads, or other enterprises considered meritorious by the state legislature. In a period when "capital" was still scarce, states encouraged and even forced banks to lend large amounts for financing selected projects.

Abuses by the State-Chartered Banks Before the Civil War

Without inferring that all the banks were guilty, we shall now investigate the principal banking abuses during this period. These abuses were so widespread that they greatly influenced both public attitudes toward banks and subsequent banking legislation. Some of the most serious abuses were the following:

1. **Violent Fluctuations in the Amount of Money Created by the Banks in the Form of Bank Notes and Checking Deposits.** With the transfer of federal deposits from the Second Bank to selected state banks and the removal of the moderating hand of the Second Bank, both the number of state banks and the volume of their credit increased. This is shown in Table 7-1.

TABLE 7-1. State Banks, 1834-1861

Year	Number of State Banks	State Bank Notes Outstanding (in millions)	Deposits at State Banks (in millions)	Total States Bank Notes and Deposits (in millions)
1834	506	$ 95	$ 76	$171
1835	704	104	83	187
1836	713	140	115	255
1837	788	149	127	276
1838	829	116	85	201
1839	840	135	90	225
1840	901	107	76	183
1841	784	107	65	172
1842	692	84	62	146
1843	691	59	56	115
1844	696	75	85	160
1845	707	90	88	178
1846	707	106	97	203
1847	715	106	92	198
1848	751	129	103	232
1849	782	115	91	206
1850	824	131	110	241
1851	879	155	129	284
1852	815	161	137	298
1853	750	146	146	292
1854	1208	205	188	393
1855	1307	187	190	377
1856	1398	196	213	409
1857	1416	215	230	445
1858	1422	155	186	341
1859	1476	193	260	453
1860	1562	207	254	461
1861	1601	202	257	459

SOURCE: Board of Governors of the Federal Reserve System, *Banking Studies*, Washington, D.C., 1941, pp. 417-418.

This growth was far from steady, however. The banks would expand rapidly for a time and then undergo severe contraction. The principal expansions and contractions during this period are shown in Table 7–2,

TABLE 7–2. Principal Expansions and Contractions of State Bank Notes and Deposits, 1834–1860

Period	Percentage Expansion (+), or Contraction (−)		
	Bank Notes	Bank Deposits	Total Notes and Deposits
1834–1837	+ 56	+ 67	+ 61
1837–1843	− 60	− 56	− 58
1843–1848	+119	+ 84	+102
1848–1849	− 11	− 12	− 11
1849–1854	+ 78	+107	+ 91
1854–1855	− 9	+ 2	− 4
1855–1857	+ 15	+ 21	+ 18
1857–1858	− 28	− 19	− 24
1858–1860	+ 36	+ 37	+ 35

SOURCE: Derived from data in Table 7–1.

though the data are admittedly imperfect. Business activity and prices fluctuated widely as banks alternated inflationary periods of increased money supplies and liberal loans with periods of shrinking money supplies and reduced loans. The banks' policies were not the sole causes of these fluctuations, but they were unquestionably contributory.

2. Inadequate Bank Capital. Having used all the devices described earlier, many banks failed to maintain large enough capital accounts to protect their creditors. Some made no pretense of having adequate capital. Others had a large enough nominal capital, but it was paid for with the promissory notes of the stockholders, many of whom were unable to meet their obligations. Even when bank stocks were initially paid for with gold or silver, stockholders often borrowed back the coin, giving in return their doubtful paper. Furthermore, bank capital was frequently dissipated by excessive dividend payments.

3. Risky and Illiquid Loans. Many of the banks made highly risky and highly speculative loans without regard for the safety of their creditors, and some lent excessively to their own stockholders and officers. Moreover, many of the loans were highly illiquid. This was especially true of the banks' large loans on real estate, much of which was not in use but was being held for speculative purposes. This combination of inadequate bank capital and highly risky and illiquid loans could lead but to one

result: numerous bank failures and serious losses to noteholders and depositors.

4. Inadequate Reserves Against Notes and Deposits. In certain of the state banking laws the reserve requirements were either wholly absent or very inadequate, and evasions of existing requirements were widespread. Many banks issued large quantities of notes and deposits with little or no regard for their reserve situation and with little ability to redeem their obligations on demand.

As a result of all these abuses—excessive issues of bank notes, inadequate bank capital, risky and illiquid bank assets, and highly inadequate reserves—bank notes had widely differing values. The notes of some banks were freely redeemed in gold and silver and circulated at their face value. Others circulated at small but varying discounts; still others circulated at only a small percentage of their face value; and many became completely worthless. A "know your money" campaign would have been an utter failure in this period.

State bank notes in this period may be divided into four main categories: (1) genuine notes of banks still in operation, (2) genuine notes of failed banks, (3) genuine notes whose denominations had been raised, and (4) counterfeits. The genuine notes of banks still in operation varied greatly in value, for around 1860 such notes were issued by nearly 1600 banks operating under the widely diverse laws of some 30 states. Even the banks in a given state varied widely in quality. Some, as we have seen, issued their notes in moderation and redeemed them freely in specie. Others issued notes in great quantity, with virtually no assets behind them, and then employed ingenious devices to avoid redeeming them. For example, an enterpriser would secure a bank charter, pledge virtually worthless securities as collateral for a large volume of bank notes, set up a banking "office" in a remote swamp, put the notes into circulation, and use various ruses to keep his location secret. Only later would some innocent recipient of the bank's notes find that they were virtually worthless.

The period was a counterfeiter's paradise. Each of the hundreds of banks issued notes of its own design and in many denominations; the notes were made of many kinds of paper, mostly of low quality; the workmanship on the genuine notes was usually poor; and no one could be familiar with all the bank notes outstanding. Under these conditions, it was easy to raise the denomination of genuine notes and to issue counterfeits on existent or even nonexistent banks. "Bicknall's Counterfeit Detector and Bank-Note List" of January 1, 1839, contains the names of "54 banks that had failed at different times; of 20 fictitious banks, the

pretended notes of which are in circulation; of 43 banks besides, for the notes of which there is no sale; of 254 banks, the notes of which have been counterfeited or altered; and 1,395 descriptions of counterfeited or altered notes [then] supposed to be in circulation, from one dollar to five hundred."[2] That these conditions had not been remedied by 1858 is indicated by the fact that Nicholas's *Bank Note Reporter* gave 5400 separate descriptions of counterfeit, altered, and spurious notes. There were 30 different counterfeit issues of the Bank of Delaware notes.[3]

The numerous "counterfeit detectors and bank note reporters" that attempted to warn against counterfeits and to indicate the current values of the various bank notes were of only limited assistance. Even with their supplements they were often out of date, they were beyond the reach of small tradesmen and individuals, and they could not remove the confusion in trade resulting from the fact that the price charged for an article depended on the type of bank note with which payment was to be made.

Though banking abuses during this period were widespread, we must not leave the impression that all state banks were unsound. Some states, notably New York, Massachusetts, and Louisiana, enacted highly protective banking laws and implemented them with bank supervision and examinations. In fact, some of these laws, especially those of New York, contributed much to the legislation establishing the national banking system.

Moreover, it should not be concluded without investigation and analysis that banks which "play it safe" are always more socially beneficial than those that assume large risks in both the types and amounts of their loans. On the one hand, we want banks to be safe, we do not want them to fail, and we want them to keep their bank notes and deposits continuously at parity with other types of money. On the other hand, we want banks to stand ready to finance productive projects, some of which are inherently risky. It may well be that some of the banks that made highly risky loans contributed more to American economic development and growth than some that were overly concerned with safety. It is not always easy to find an optimum balance of these objectives.

THE NATIONAL BANKING SYSTEM, 1863–1914

In 1863, just 27 years after the expiration of the Second Bank of the United States, the federal government again entered the banking field

[2] Raguet, quoted by Horace White, *Money and Banking*, Boston, Ginn, 1896, pp. 403–404.

[3] *Ibid.*, p. 398.

by passing "An Act to provide a national currency, secured by a pledge of United States Stocks, and to provide for the Circulation and Redemption thereof." The 1863 law, which contained a large number of imperfections, was replaced by a new law in 1864. This latter is usually referred to as the National Banking Act.

In providing for a new system of national (federally chartered) banks to be owned and operated by private individuals, Congress had two principal motives: (1) to replace the unsound and unsafe state banking system with new banks that would issue safe and uniform currency, and (2) to secure a new source of loans with which to finance the Civil War. Ever since the demise of the Second Bank, there had been widespread demands for banking reform, and many contended that a satisfactory system of note issue could be achieved only with centralized control and uniform notes. This demand was not successful, however, until reinforced by the exigencies of Civil War finance. Secretary Chase and others believed that they could create an additional market for government bonds by permitting the creation of new banks that could issue notes only on the basis of their holdings of these securities. Thus, the National Banking System owes its birth to the demand for safer types of bank money and to the financial embarrassment of the Treasury. But it proved more useful as a means of banking reform than as a source of Civil War funds.

Principal Provisions of the National Banking Act

We have already said that the National Banking Act owed much to earlier state banking laws, especially those of New York. The new law provided for "free banking." Anyone meeting the general requirements of the Act was to receive a charter and permission to engage in banking. A new office, the Comptroller of the Currency, was created in the Treasury Department to grant charters and to administer all laws relating to national banks. Some of the principal provisions regulating the establishment and operation of national banks were the following:

1. Capital. To enhance bank safety, several capital requirements were imposed. Minimum capital requirements were fixed as follows:

$ 50,000 in cities of not over 6000 inhabitants
$100,000 in cities with from 6000 to 50,000 inhabitants
$200,000 in cities with over 50,000 inhabitants[4]

At least 50 percent of the subscribed capital had to be paid in before a bank could begin business, and the remainder had to be paid within

[4] From 1900 to 1933 the minimum capital requirement was only $25,000 in places with not more than 3000 inhabitants. This was re-established at $50,000 in 1933.

five months. The stock was subject to double liability. In order to expand the market for government securities, each bank was required to deliver to the Treasury of the United States registered bonds amounting to not less than $30,000, or one-third of its capital stock, whichever was larger.[5] These bonds could be used as collateral for issues of national bank notes.

2. Regulation of Bank Loans. In order to promote safety and liquidity, many restrictions were placed on bank assets. Each national bank was forbidden to lend on real estate or to lend to any one borrower an amount exceeding 10 percent of its capital stock.

3. Supervision and Examination. In order to ensure compliance with both the letter and the spirit of the Act, national banks were required to supply the Comptroller of the Currency with periodic reports on their financial condition and were made subject to examination by his representatives.

4. Reserve Requirements Against Notes and Deposits. In order to enhance bank liquidity and limit the amount of bank money, minimum reserve requirements were specified for both circulating notes and deposits. Banks in reserve and central reserve cities were required to hold reserves of 25 percent and banks in other cities of 15 percent of their outstanding circulating note and deposits. In 1874 national banks were relieved of the necessity of carrying reserves against their note issues.

5. Protection to Note Holders. Remembering the sorry record of state bank notes, the framers of the National Banking Act were determined that national bank notes should be perfectly safe, that they would all
culating note and deposits. In 1874 national banks were relieved of the
ways be freely redeemable. To this end the Act provided that:

(a) These notes could be issued only against United States government bonds deposited with the Comptroller of the Currency, the amount of notes not to exceed 90 percent of the par value of the bonds or 90 percent of the market value of the bonds, whichever was smaller.
(b) The issuing bank should maintain a redemption fund with the Comptroller equal to 5 percent of its outstanding notes, though this could be counted as part of the bank's required reserve.
(c) In case of refusal by a national bank to redeem its notes, the Comptroller might sell the pledged bonds and use the proceeds to pay note holders, any remaining claims of note holders to constitute a first claim against the assets of the bank.
(d) No national bank might issue notes in amounts exceeding its capital stock.
(e) The total circulation of national bank notes should not exceed $300 million (this limitation was later revised and was wholly removed after 1875).

[5] This requirement that national banks buy government securities was modified toward the end of the century and dropped after 1900. The double-liability provision was repealed during the depression of the 1930s.

(f) Each national bank should accept the notes of every other national bank at par.

Thus, every effort was made to insure the safety and parity of value of national bank notes. In these respects the Act was successful.

State Banks

It was hoped that the authorization of national banks would induce state banks to take out federal charters and comply with the requirements of the National Banking Act. When it became evident that few state banks were going to do this, Congress decided to force the issue by levying a 10 percent tax on any bank or individual paying out or using state bank notes. The purpose was to end the issuance of circulating notes by state banks and to force all or most of these banks to become national banks or to cease doing a general banking business. As shown in Table 7–3, the Act did succeed in reducing the number of state banks from

TABLE 7–3. State and National Banks in the United States, 1864–1914

Year	State Banks	National Banks
1864	1,089	467
1868	247	1,640
1870	325	1,612
1880	650	2,076
1890	2,250	3,484
1900	5,007	3,731
1910	14,348	7,138
1914	17,498	7,518

SOURCE: Board of Governors of the Federal Reserve System, *Banking Studies*, Washington, D.C., 1941, p. 418.

1089 in 1864 to 247 in 1868. After that time, however, state banks again began to expand, and by 1914 they outnumbered national banks by more than 2 to 1.

How were state banks able not only to survive but even to expand greatly in spite of the prohibitive tax on their notes? First and foremost is the fact that note issue had become of much less importance in banking. With the growth of cities and more rapid transportation and communication, people used checking deposits more and more as a means of payment. With the privilege of creating checking deposits, a bank could now operate successfully without issuing notes. But why did many banks prefer to operate under state rather than federal charters when

national banks also had the right to create circulating notes? The answer is to be found largely in the fact that many states imposed less rigid restrictions and granted more liberal powers than those contained in the National Banking Act. In general, state banking laws provided lower capital requirements, lower reserve requirements, less supervision by the government, more liberal powers to lend on real estate, greater ability to accept drafts drawn on a bank, and more power to engage in fiduciary activities such as operating trust departments. This was especially true in the western and southern states, where many of the state banks were located.

Shortcomings of the National Banking System

Though the National Banking System unquestionably raised greatly the general quality of United States banking, it became subject to increasing criticism. Demands for further bank reform swelled during the late years of the nineteenth century and grew still more in the first years of the twentieth, finally ushering in the Federal Reserve System in 1914. Although many aspects of national banks were criticized, the greatest complaint was against their "inflexibility," or "inelasticity." The keynote of the National Banking Act was safety, especially safety of national bank notes. Less attention was paid to the safety of deposits. Critics now complained that the system was too inflexible and that it must be given a greater degree of "elasticity." The meaning of this term was often unclear, but we can discover its general import as we proceed.

Though national bank notes were safe, there was no provision for appropriate variations in their quantity over the long run, in response to seasonal variations in the need for them, and during crisis periods. We have already seen that these notes could be issued only on the basis of federal bonds, the amount of notes being limited to 90 percent of the par or market value (*whichever was lower*) of the bonds deposited with the Comptroller. Thus, the supply of national bank notes depended on the government bond market. The supply obviously could not exceed 90 percent of the eligible bonds outstanding. Within this limit, the quantity of notes actually issued by banks depended on the profitability of issuing them. When government bonds could be purchased at or below par, a relatively large volume of national bank notes was issued, since a bank could issue notes equal to 90 percent of the purchase cost of the bonds. But the profitability of issuing notes was decreased, and in some cases eliminated, as the market price of bonds rose above their par value. It was for these reasons that the volume of national bank notes

outstanding fell from $352 million in 1882 to $162 million in 1891, a reduction of 54 percent. But they had risen to $715 million by 1914. Critics maintained that a note system of this type based on the government bond market could never supply a properly "elastic" currency that would respond properly to the needs of business. The volume of these notes fluctuated, but not necessarily in ways that were appropriate to economic needs.

National bank notes were also criticized for their lack of seasonal elasticity. The demand for currency for hand-to-hand use showed marked seasonal variations, reaching peaks in the early autumn and around Christmas and dropping to lower levels during other seasons. Yet the volume of outstanding national bank notes remained relatively constant throughout the year; hence, banks could meet seasonal peak demands for currency only by draining funds from their reserves, and the inflow of currency to the banks during slack seasons increased their reserves. Critics complained that the seasonal inelasticity of national bank notes brought about seasonal credit stringencies by forcing banks to draw down their reserves to meet peak seasonal demands for cash, and then leading to an undue easing of credit in other seasons as currency flowed back into bank reserves. They demanded the creation of a currency that would be seasonally elastic, that would increase and decrease with seasonal demands for coin and currency and would leave bank reserves unaffected.

Critics also complained of the inelasticity of national bank notes during banking crises. They pointed out that there was no existing way in which new currency could be created to satisfy general demands on the banks for cash, and that banks could not meet these demands out of the limited cash in their vaults. They proposed the authorization of a new type of currency whose quantity could be increased to meet crisis demands and then be decreased again as demands for cash subsided. We shall see later that one of the principal purposes of the Federal Reserve Act of 1914 was to supply an elastic currency in the form of Federal-Reserve notes.

The disturbing effects of an inelastic bank note system were intensified by a defective system of reserve requirements. We have already seen that national banks were required to maintain reserves against both notes and deposits (later, against deposits only) equal to 25 percent in central reserve and reserve cities and 15 percent in other places. The banks in a few of the largest cities such as New York, Chicago, and St. Louis, were designated as "central reserve city banks"; those in 47 other cities, as "reserve city banks"; and those in other places, as "country banks." This general classification of banks for the purpose of fixing reserve require-

ments was carried over into the Federal Reserve Act. Though these reserve requirements appeared large, the form of reserves was defective, as is suggested by the following summary:

Type of Bank	Percentage Reserve Requirement	Composition of Required Reserves
Country banks	15	2/5 of reserve (or 6% of deposits) as cash in vault; remaining 3/5 of reserve (9% of deposits) to be either cash in vault or deposits with reserve city or central reserve city banks
Reserve city banks	25	½ of reserve (12.5% of deposits) as cash in vault; remaining ½ of reserve (12.5% of deposits) as either cash in vault or deposits in central reserve city banks
Central reserve city banks	25	All cash in vault

This reserve system had three principal weaknesses. In the first place, a large part of the nominal reserve was "fictitious" in the sense that it was not available for meeting actual cash drains from the banking system. This was because such a large part of the reserves was in the form of deposits with other banks, which in turn held only a small percentage of actual cash as a reserve against their deposit obligations. Suppose, for example, that customers of country banks should demand large amounts of coin or currency. Holding an actual cash reserve equal to only 6 percent of their deposits, the country banks would call on the reserve city banks to send them cash. But the reserve city banks held a reserve equal to only 25 percent of their total deposits, only half of the reserve being in actual cash. To meet the drain, they in turn would call upon central reserve city banks for cash; but these banks had reserves equal to only 25 percent of their deposits. Thus, the central reserve and the reserve city banks were in a precarious position; they were liable to drains not only by their own customers, but by all the banks that held "reserves" in the form of deposits with them. The threat of general cash withdrawals by the public or of a suspension of cash payments by the banks in large cities could therefore bring on a banking panic, or at least a general tightening of credit, for it would lead country banks to withdraw their "reserves" from reserve city and central reserve city banks in order to hold their reserves in the form of cash in their own vaults, and the reserve city banks

would make similar withdrawals from the central reserve city banks. It is no wonder that the National Banking System was susceptible to panics.

In the second place, reserve requirements were very inflexible. Each bank was ordered to meet its reserve requirements at all times; it could not legally make any new loans while its reserves were deficient. Thus, when banks had lent up to the limit permitted by their reserves, and especially when their reserves had decreased, new lending was brought to a sudden stop and a scramble to liquidate loans was likely to occur. There arose a general demand that reserve requirements be relaxed by being suspended in periods of crisis, or at least by banks' being allowed to meet these requirements on the average over a period of time, deficiencies at one time being balanced by overages at another. This latter method is employed for banks that are members of the Federal Reserve System.

In the third place, many criticized the "parcelation of reserves" resulting from the lack of any orderly way of pooling the reserves of individual banks to meet drains of cash from any segment of the banking system. Some compared existing reserve requirements with attempts to fight fires by placing a pail of water in each house; the greater effectiveness of pooling the water and providing a system of pipes to concentrate it at the point of need is obvious. Advocates of bank reform proposed the establishment of a similar system of pooling individual bank reserves so that they could be concentrated at the points of greatest need in time of emergency. This was another purpose of the Federal Reserve Act of 1914.

The inelasticity of national bank notes and the defects, or at least the inadequacy, of bank reserve requirements were dramatized by the recurrent banking panics that occurred under the National Banking System before 1914. There were full-fledged panics in 1873, in 1884, in 1893, and in 1907, and serious credit stringencies threatened at other times. Unable to meet their obligations to pay cash on demand, most banks suspended payments for periods of varying lengths; some of them never reopened, a mad scramble to call loans ensued, and business-activity suffered. The panic of 1907 was the last straw; popular disgust with recurrent panics made the Federal Reserve Act politically possible, though it had objectives beyond that of panic prevention.

Summary

When the Federal Reserve Act was passed in 1913, it had been 121 years since the establishment of the first modern-type bank in the United States in 1792. This long period had been one of controversy and vacilla-

tion, but out of it emerged many aspects of banking structure and policy that are still observable. In the struggle for power to charter and regulate commercial banks, neither the advocates of federal jurisdiction nor the advocates of state jurisdiction had won a complete victory. The outcome was a compromise, with both the federal government and the 48 states remaining in the field. After two temporary successes with the First and Second Banks, the federal government entered the field permanently with the authorization of national banks in 1863. Through the device of taxing their notes it even succeeded in depriving state-chartered banks of the privilege of note issue. Yet state banks multiplied and by 1914 accounted for more than two-thirds of all commercial banks in the United States. They had become so firmly established, both economically and politically, that it has been impossible to secure federal legislation to force them to join the Federal Reserve System and subject themselves to its jurisdiction. Their friends still successfully insist that they should have the privilege of joining if they wish to do so, but that they should not be subjected to legal compulsion. This so-called dual banking system (the coexistence of federal- and state-chartered banks without a clear centralization of responsibility for their creation and regulation) puzzles many foreign observers who are accustomed to centralized jurisdiction over banks.

By the early twentieth century, the banking systems of most other countries had become highly concentrated. There were only a few banks, each operating many branches. In contrast, the United States had more than 25,000 commercial-banking corporations in 1914. A great majority of these had only a single office; most of the branch banks that did exist operated only a few offices, and none was more than statewide in scope. In short, the American system was predominantly one of "independent unit banking." This structure was encouraged by nineteenth century policies that permitted ease of entry and discouraged the establishment of branches. "Free banking," first permitted in New York and Michigan in the 1830s, but soon adopted in other states and in the National Banking Act, opened banking to all who could meet the requirements laid down in the general banking laws. Even the requirements in the National Banking Act were liberal enough to permit the establishment of many national banks. Most of the state requirements were even less onerous. While banking laws permitted ease of entry, they became increasingly restrictive against branch banking. As noted earlier, many of the early banks were branch systems. Both the First and Second Banks of the United States operated nationwide systems of branches. Many of the state banks also had branches.

Despite this early history, the National Banking Act made no specific mention of branches and this was construed as a prohibition. However, an amendment in 1865 permitted a state bank converting into a national bank to retain its existing branches. Many of the states also enacted restrictive laws. Some permitted no branches; others limited their geographical area or number. These restrictions on branch banking tended in at least two ways to encourage the establishment and continuation of a large number of independent unit banks. In the first place, by limiting the ability of existing banks to supply additional banking facilities through the establishment of branches, they encouraged the establishment of new independent unit banks. In the second place, they discouraged bank mergers by prohibiting, or at least restricting, the conversion of absorbed banks into branches.

We shall see later that the structure of our banking system is still a highly controversial issue. Neither public officials nor bankers can agree upon the relative merits and roles of independent unit banks and multiple office banking.

BANKING SINCE 1914

Though we shall later deal with many aspects of contemporary commercial banking, it will be useful at this point to look briefly at a few of the main events in our banking history since the establishment of the Federal Reserve System in 1914.

The Number of Banks

As we have seen, the number of banks grew rapidly during the late nineteenth and early twentieth centuries. In 1870, there were fewer than

TABLE 7–4. Commercial Banks in the United States, 1914–1962

Year	Total	State Banks	National Banks
1914	25,510	17,992	7,518
1921	29,788	21,638	8,150
1929	25,113	17,583	7,530
1941	14,305	9,175	5,130
1962	13,429	8,924	4,505

SOURCES: Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics*, Washington, D.C., 1943, p. 16. *Federal Reserve Bulletin*, May, 1963, p. 664.

2000 banks in the United States; by 1914, there were more than 25,000; and by 1921 there were nearly 30,000. But this was the peak, to be followed by a sharp decline. By the mid-1960s, only four decades later, the

number of banks had declined by more than 50 percent—this despite a growth of the nation's population and an even greater growth of its real income and wealth. Why did this reversal occur?

The decrease in the number of banks obviously reflects the fact that the number of banks discontinuing operations greatly exceeded the number of new banks created. But why did so many banks discontinue operations? Most of them failed; a smaller number were merged with other banks. Though not all the bank failures involved losses to depositors, a large proportion of them did.

Bank Failures

Even in the nineteenth and early twentieth centuries the United States enjoyed the dubious distinction of having one of the highest failure rates, if not the highest, to be found in any important commercial banking system. Nearly 3000 banks failed in the 1864–1920 period. But the worst was yet to come.

Another 5411 banks had suspended operations by 1929, and still another 8812 by the end of 1933. The mortality rate was especially high among smaller banks, but many large ones fell. Since the banking purge and reform of 1933, bank failures have been very few.

TABLE 7–5. Bank Suspensions in the United States[a]

Period	National Banks	State Banks	Total
1864–1896	328	1,234	1,562
1897–1920	256	1,177	1,433
1921–1929	766	4,645	5,411
1930–1933	1,947	6,865	8,812
1934–1950	72	343	415
Total	3,369	14,264	17,633

[a] The figures are not strictly accurate or comparable for different periods, but they indicate the general situation faithfully enough for our present purposes.

SOURCES: For the period 1864–1896, Cyril B. Upham and Edwin Lamke, *Closed and Distressed Banks*, Washington, Brookings Institution, 1934, p. 245. For 1897–1941, Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics*, Washington, D.C., 1943, p. 283. For the period since 1941, *Annual Reports of the Federal Deposit Insurance Corporation*.

To generalize about the reasons for failures of any type of business enterprise is difficult, for the reasons vary from case to case and, even in a particular case, failure usually results not from a single cause but from a combination of conditions. Nevertheless, it is possible to isolate some of the most important factors making for high bank-failure rates prior to 1934.

1. Inherent Weaknesses in Small Independent Unit Banks. Whatever may be the relative merits of large independent unit banks and branch banking systems, it is clear that small independent unit banks are especially liable to failure. Many are too small to be efficient, their management is often not well trained, and a large percentage of their assets is likely to be in the form of loans to local agriculture, industry, or trade. Thus, they are likely to be weak in the face of unfavorable economic developments, not only those in the economy at large, but also those limited to their own localities.

2. "Overbanking." Because it is difficult to specify the "proper" amount of banking for an area, it is difficult to say precisely when the area is "overbanked." Yet, despite the ambiguity of the term, it is clear that many places were overbanked in the early 1920s when we had nearly 30,000 banks, and that this situation was remedied only slowly. Some places did not have excessive total amounts of banking resources, but they had too many small banks to achieve efficiency and safety. It was not unusual for a village with 2000 inhabitants to have three or more banks; many small and medium-sized cities were similarly overbanked. Some banks in such situations would have failed even under favorable economic conditions; adverse economic developments assured disaster.

3. Shifts in the Location of Business. Thousands of banks were seriously weakened by the revolution in highway transportation during the 1920s and 1930s. Prior to the days of hard-surfaced roads, automobiles, and farm trucks, farmers took much of their business to nearby agricultural villages or small towns. Here they sold many of their products, bought supplies, and did their banking. But as new roads and motor vehicles increased the speed and reduced the cost of transportation, the farmer took his business (including his deposits and borrowing) to the county seat or some other larger city. The smaller village or town was left to wither on the vine; its banks were fortunate if they escaped a less lingering death. Other shifts of business also helped bring about failures of individual banks: shifts of plants from one area to another, the replacement of small firms by larger ones that did their banking business elsewhere, and so on.

4. Deflation and Depression. Bank failures and business depressions are mutually aggravating; a depression tends to break banks, and bank failures deepen a depression. Falling prices, incomes, sales, and employment lessen the abilities of debtors to meet their obligations and thereby threaten both the solvency and the liquidity of banks. Many banks were destroyed or seriously weakened during the sharp deflation starting in May, 1920. The failure of agriculture to recover fully during the 1920s

injured banks that were heavily dependent on farming. Then came the great depression, which started in 1929 and lasted a decade. Thousands of banks failed to survive under its strains, and bank failures and threats of failure played an important role in deepening and prolonging the depression.

The great surge of bank failures in the early 1930s led to the establishment of a new federal institution to insure deposit liabilities of banks. A temporary plan was adopted in 1933, and this was superseded in 1935 by a permanent plan to be operated by the newly established Federal Deposit Insurance Corporation, hereafter called the FDIC. The FDIC insures the first $10,000 of each deposit account in an insured bank, charging therefor a small annual premium based on the volume of deposits.

The FDIC has three major purposes:

1. To protect depositors, and especially small depositors, against loss.

2. To protect banks and the economic system as a whole against the results of actual and threatened withdrawals of currency from the banking system. Such currency drains, actual and potential, had been a powerful deflationary force in the early 1930s. Actual currency drains had reduced bank reserves and put banks under pressure to reduce both the volume of credit extended and the money supply. And the fear of further large drains of currency motivated some banks to hold large idle reserves rather than expand their loans to the maximum. Thus, an insurance system that maintains confidence in the safety of deposits can increase the effectiveness of monetary management, both by protecting banks against reserve losses through currency withdrawals and by encouraging banks to utilize available reserves as a basis for loan and deposit creation.

3. To improve the quality of bank supervision. One might have thought that this objective would have led Congress to require all banks to join the FDIC and become subject to its examination and supervision. But again the advocates of states' rights in banking were victorious. Only members of the Federal Reserve were required to join the FDIC; state banks that are not members of the Federal Reserve have the option. In fact, however, all except about 300 nonmember banks have elected to join in order to get the competitive benefits of deposit insurance.

With the establishment of the FDIC, responsibility for regulating the structure and practices of the banking system became even more widely diffused. Banking commissioners in the 50 states retain power to charter, examine, and supervise state banks in their respective areas. Responsibility at the federal level is not concentrated. The Comptroller of the Currency continues to be empowered to charter, examine, and supervise

national banks. The Federal Reserve is empowered to examine and supervise all national banks and state member banks. The FDIC is empowered to examine and supervise all its members, which include all members of the Federal Reserve and some 7000 nonmember state banks. And, for good measure, the antitrust division of the Department of Justice sometimes intervenes when issues relating to monopoly are involved. Fortunately, there is a considerable degree of cooperation among these agencies. One should not be surprised to hear, however, that there is also competition, conflict, lack of uniformity, and at times even lack of common purpose.

Widespread banking difficulties and failures during the period between World War I and 1933 also contributed to important modifications of the policy of "free banking." In the earlier period, as already noted, the Comptroller of the Currency and most state banking authorities granted charters freely to all who met the requirements of the general banking laws. This policy has been modified because it contributed to "overbanking." Now the Comptroller and most state banking authorities refuse to grant charters when they find that the place in which the proposed bank would be located already has "adequate banking facilities." They are supposed to apply similar tests in judging applications for the establishment of new branches.

It would be pleasant to report that in granting charters, as well as in arriving at decisions regarding proposed new branch offices and mergers, the authorities strive toward a banking system characterized by efficiency, convenience to bank customers, and promotion of effective competition. But such a report would be inaccurate. Actual decisions are in too many cases influenced by jealousy between federal and state authorities, opposition by existing banks that do not want additional competition, inappropriate banking laws, and political activities by bankers. As one studies these decisions, he appreciates better the original reasons for adopting "free banking."

Independent Unit Banks and Multiple Office Banking

Recent decades have witnessed marked changes in the relative importance of independent unit banks and banks operating multiple offices. In 1900, when there were more than 8700 banks in the United States, only 87 banks had more than a single office and they operated a total of only 119 branches. Even as late as 1920 only 530 out of nearly 30,000 banks had branches, and the total number of branches was only 1281. Since that time, branch banking has grown rapidly.

By 1963, when the number of commercial banks had shrunk to 13,427,

there were 2683 branch banks with a total of 12,345 branches. Branch banking systems held well over half of all commercial bank assets. Moreover, recent decades have witnessed a large growth of *group banking*, arrangements under which two or more separately incorporated banks are controlled by a corporate holding company.

In a later chapter we shall see that the structure of our commercial banking system, involving policies relative to chartering banks, establishing branches, and regulating branch and group banking, continues to be a highly controversial issue at both federal and state levels. What the outcome will be remains to be seen, but one can be sure that many of the points of conflict will not be new to one familiar with United States banking history: conflicts of federal and state jurisdictions over banks; the long history of bank failures; the desire for "free banking" and the fear of "overbanking"; the aversion of established banks to new competition and the desire of others to establish new banks or to expand the area served by their banks; and the advantages of bigness and the fear of concentration of financial power.

III. Central Banking

8. The Federal Reserve System

In passing the Federal Reserve Act in late 1913 and actually establishing the Federal Reserve banks in November, 1914, the United States was one of the last of the great economic powers to provide itself with a central bank. The Bank of Sweden was founded in 1656, the Bank of England in 1694, the Bank of France in 1800, the Netherlands Bank in 1814, and the Bank of Belgium in 1835; most of the other leading European countries established central banks well before the end of the nineteenth century. In general outline, the functions of the Federal Reserve are similar to those of central banks in other countries. Like other central banks, its primary function is to regulate monetary and credit conditions. To this end, it creates and destroys money and regulates the creation and destruction of money by commercial banks. It also performs many other similar functions, including check clearing and collection, acting as fiscal agent for the government, engaging in operations in the foreign exchange market, and so on.

Despite these similarities, there are also important differences in the structure, control, and functioning of the various central banks. For example, most countries have only one central bank, with control clearly concentrated in a central authority. The United States has 12 separately incorporated Federal Reserve banks located in as many Federal Reserve districts, with control power divided among the 12 banks and the Board of Governors of the Federal Reserve System located in Washington. This arrangement seems sprawling indeed to those accustomed to a single central bank under centralized control.

BACKGROUND

Such differences arise from many sources, only a few of which can be mentioned here.

1. **Differences in Geographical Area.** In small countries without pro-

nounced regional variations, there was little reason to establish more than one central bank. But in the United States, with its large geographical area and differing economic and financial conditions in the various regions, it was at least plausible to argue in 1913 that each broad region should have its own central bank, which could adapt its policies to the peculiar conditions of the region.

2. Differences in Allocations of Jurisdiction over Banking. In countries where the central government enjoyed exclusive jurisdiction over chartering, supervision, and regulation of commercial banks, there was little opposition to a single central bank. This was not true in the United States, with its dual banking system.

3. Differences in Commercial Banking Structures. In countries with only a few banks, each operating a nation-wide system of branches, it was clear that the banking system could best be regulated by a centralized management in the nation's financial center. This was not clear in the United States, with its thousands of banks, most of them operating only a single office and none with branches outside its home state.

To understand the original structure and control of the Federal Reserve System and its evolution since 1914, it is helpful to bear in mind some aspects of American monetary history before 1913 and the objectives of those responsible for the passage of the Federal Reserve Act. The major point to be emphasized is that the purposes of the Federal Reserve System as conceived by its originators were far different from those of today. Almost everybody now believes that the primary purpose of the Federal Reserve is to manage money deliberately and continuously. We believe that "money will not manage itself; it must be managed." And we expect the Federal Reserve to use its powers continuously and positively to promote the achievement of selected objectives, such as high levels of employment, economic growth, and stable price levels.

Such ideas were alien and unacceptable to those who conceived and established the Federal Reserve System. They did not want a "managed money"; they were well pleased with the international gold standard then in operation. After decades of controversy over bimetallism, greenbackism, and other "unsound" proposals, the nation had confirmed its loyalty to the international gold standard by adopting the Gold Standard Act of 1900. The following decade of rising gold production, rising price levels, and prosperity seemed to confirm the wisdom of the decision. There would almost certainly have been no Federal Reserve System if its advocates had heralded it as an instrument for continuous monetary management. This function of the Federal Reserve developed only several years later when the international gold standard had broken down

and the nation had, for the first time in its history, accumulated a large volume of excess gold reserves.

Thus, the original purpose of the Federal Reserve was not the ambitious one of introducing a high degree of monetary management, but the much more limited one of remedying a number of shortcomings in the existing system of state and national banks. The Federal Reserve Act sought to replace the slow and expensive system of check-clearing and collection with one that would be faster and more efficient; to provide a more satisfactory fiscal agent for the federal government; to achieve a better coordination of state and national banks, and especially to secure more effective supervision of state banks; to promote the development of an acceptance market in the United States; and to provide more liberal powers for national banks, such as those of establishing trust departments and lending on real estate, to enable them to compete more effectively with state banks and trust companies, many of which enjoyed more freedom of action. These reforms were important, but they were secondary. The primary purpose of the new banking reform was to end recurrent banking panics and crises. The panic of 1907, following similar events in 1893, 1884, and 1873, and serious credit stringencies on several other occasions, was the last straw; banking reform became politically feasible. As Carter Glass told the House of Representatives:

> Financial textbook writers in Europe have characterized our banking as "barbarous," and eminent bankers of this country . . . have not hesitated to confess that the criticism is merited. . . . The failure of the system in acute exigencies has caused widespread business demoralization and almost universal distress. Five times within the last thirty years financial catastrophe has overtaken the country under this system; and it would be difficult to compute the enormous losses sustained by all classes of society—by the banks immediately involved; by the merchants whose credits were curtailed; by the industries whose shops were closed; by the railroads whose cars were stopped; by the farmers whose crops rotted in the fields; by the laborer who was deprived of his wage. The system literally has no reserve force. The currency based upon the nation's debt is absolutely unresponsive to the nation's business needs. The lack of cooperation and coordination among the more than 7300 national banks produces a curtailment of facilities at all periods of exceptional demand for credit. This peculiar defect renders disaster inevitable.[1]

Many other observers agreed with Glass that the primary problem was that the existing system had no "reserve force," no "elasticity" in time of strain. No existing institution was motivated to hold large excess reserves for use in time of strain, none had the power to create new bank reserves in such periods, and none was empowered to create additional currency in time of need. The remedy followed from the diagnosis; there should

[1] *The Congressional Record*, September 10, 1913, p. 4642.

be created new institutions to provide a "reserve force," to provide "elasticity." Some part of the nation's gold reserve should be concentrated in the new institutions, which would be empowered to create new currency and new bank reserves "as needed." "Elasticity" was the central theme of the new "reserve system."

Even among those who favored banking reform, and many did not, there were widely differing opinions as to the proper control and structure of any new institutions that might be established. Some thought they should be regarded as cooperative or mutual aid societies formed by banks to enable banks to function more safely and effectively. To those holding this view, it seemed only natural that banks should contribute the capital of the new institutions and exercise exclusive control over them. Others thought that the new institutions should be regarded as regulators of banks and that to allow bankers to regulate themselves would be absurd. This was properly a function of the government or its appointees. Opinions as to the proper structure of the new system also differed. Some insisted that the United States, as did most other countries, should have a single central bank with centralized control. Such a single institution could most effectively pool the nation's gold reserves, make its resources available at the points of greatest need, and effectuate a national credit policy. Others thought such centralization both unnecessary and undesirable. It would bring a dangerous concentration of financial power, invite domination of the entire country by Wall Street or Washington, and ignore regional differences in economic and financial conditions. One congressman thought that 50 such regional institutions would be about the right number.

The Federal Reserve Act represented a compromise among such conflicting views. The country was divided into a number of districts, each with its own Federal Reserve bank, and a central authority was established in Washington to supervise the various Reserve banks and to coordinate their policies while permitting some degree of regional autonomy.

STRUCTURE OF THE FEDERAL RESERVE SYSTEM

The 12 Federal Reserve Banks and Their Branches

The Federal Reserve Act provided that the continental United States should be divided into not less than 8 nor more than 12 Federal Reserve districts, each to have a Federal Reserve bank. The maximum number of districts and Reserve banks was established at the outset, so we have 12 Federal Reserve banks and 12 Federal Reserve districts. The boundaries of these districts are shown on the map in Fig. 8–1. Each Federal Reserve

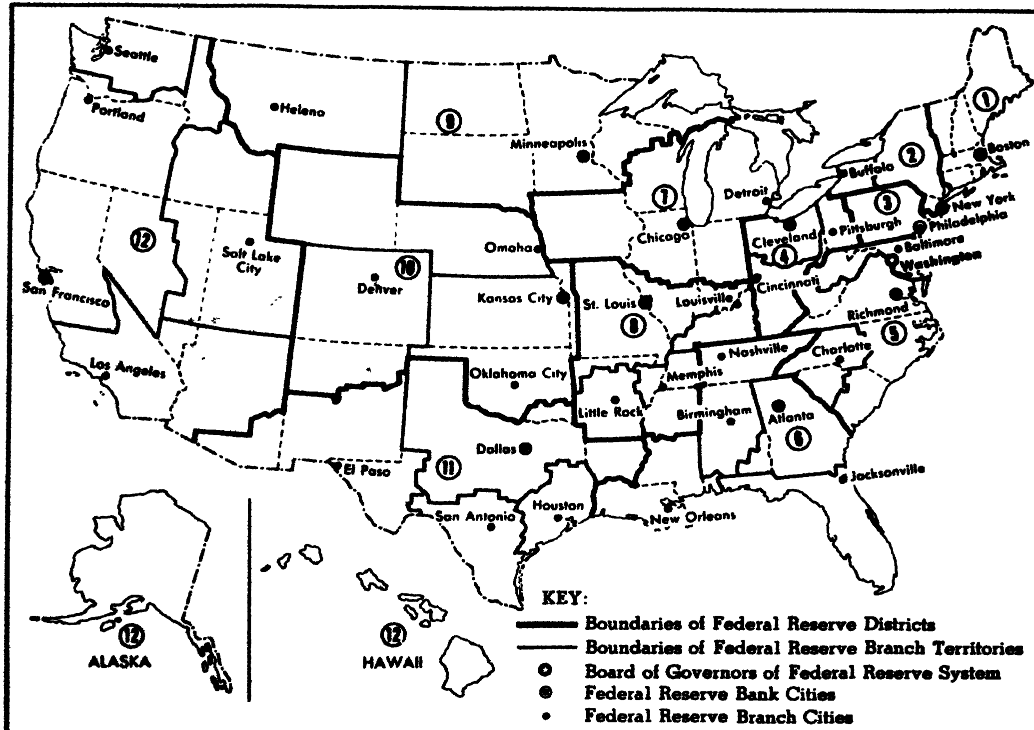

FIG. 8–1. Federal Reserve Districts, Federal Reserve Banks, and Branches of Federal Reserve Banks.

bank is named after the city in which it is located; thus, there is the Federal Reserve Bank of Boston, The Federal Reserve Bank of New York, and so on. To facilitate their operations, some of the Federal Reserve banks have established branches in their districts. There are now 24 of these branches distributed unequally among the various Federal Reserve districts.

It is interesting to note, as is shown in Table 8–1, that the Federal

TABLE 8–1. Relative Sizes of the 12 Federal Reserve Banks, April 30, 1963

Federal Reserve Bank of	Assets (in Billions)	Percent of Total Federal Reserve Bank Assets
Boston	$ 3.0	5.5
New York	13.6	24.9
Philadelphia	3.0	5.5
Cleveland	4.4	8.1
Richmond	3.7	6.8
Atlanta	3.2	5.8
Chicago	9.1	16.6
St. Louis	2.2	4.0
Minneapolis	1.2	2.2
Kansas City	2.3	4.2
Dallas	2.1	3.8
San Francisco	7.0	12.7
Total	$54.6	100.0

SOURCE: *Federal Reserve Bulletin*, May, 1963, p. 657.

Reserve banks differ greatly as to both size and influence on credit and monetary conditions. The Federal Reserve Bank of New York, which is by far the largest, holds nearly a quarter of the total assets of all the Reserve banks. The predominance of the New York Bank is even greater than these statistics imply, for it is the principal point of contact with foreign central banks, it has a direct influence on international financial transactions, it is located in the midst of the great New York money market, which draws funds from and dispatches funds to every part of the country and member banks of which (especially the giant banks in New York City) greatly influence banks in all parts of the nation through their correspondent relationships. At the other extreme, the relatively small Federal Reserve Bank of Minneapolis holds only 2.2 percent of all the assets of the Reserve banks, and its actions have much less influence on nation-wide credit and monetary conditions.

Each Federal Reserve bank has many "member banks," by which we mean the commercial banks in the district that have met at least the

minimum requirements and have been accepted for membership in the Federal Reserve System.[2] As a member of the Federal Reserve, a commercial bank has both obligations and privileges. It must continue to

FEDERAL RESERVE DISTRICTS, FEDERAL RESERVE BANKS, and BRANCHES of the FEDERAL RESERVE BANKS

Federal Reserve District Number	*District Banks*
1	Federal Reserve Bank of Boston
2	Federal Reserve Bank of New York
	Branch: Buffalo, New York
3	Federal Reserve Bank of Philadelphia
4	Federal Reserve Bank of Cleveland
	Branches: Cincinnati, Ohio
	Pittsburgh, Pennsylvania
5	Federal Reserve Bank of Richmond
	Branches: Baltimore, Maryland
	Charlotte, North Carolina
6	Federal Reserve Bank of Atlanta
	Branches: Birmingham, Alabama
	Nashville, Tennessee
	Jacksonville, Florida
	New Orleans, Louisiana
7	Federal Reserve Bank of Chicago
	Branch: Detroit, Michigan
8	Federal Reserve Bank of St. Louis
	Branches: Little Rock, Arkansas
	Louisville, Kentucky
	Memphis, Tennessee
9	Federal Reserve Bank of Minneapolis
	Branch: Helena, Montana
10	Federal Reserve Bank of Kansas City
	Branches: Denver, Colorado
	Oklahoma City, Oklahoma
	Omaha, Nebraska
11	Federal Reserve Bank of Dallas
	Branches: El Paso, Texas
	Houston, Texas
	San Antonio, Texas
12	Federal Reserve Bank of San Francisco
	Branches: Los Angeles, California
	Portland, Oregon
	Salt Lake City, Utah
	Seattle, Washington

meet various requirements for membership, submit to supervision and examination by Federal Reserve authorities, subscribe to stock in its

[2] Morris Plan banks and certain other incorporated banking institutions engaged in a similar type of business may also petition for membership.

Federal Reserve bank, and hold all its legal reserves in the form of cash in vault or deposit at its Federal Reserve bank. On the other hand, it enjoys the privilege of borrowing from its Federal Reserve bank and of using the other facilities of the System.

Before the establishment of the Federal Reserve System, there were wide differences of opinion as to which commercial banks should be required or permitted to become members. At one extreme, those who were opposed to further "regimentation" of banks would have made membership in the System optional with each bank. At the other extreme, some would have forced every commercial bank in the country to become a member or cease to perform commercial banking functions. Here, again, the issue was settled by compromise. Every national bank must become and remain a member of its Federal Reserve bank or forfeit its federal charter. Each state bank may, at its option, become a member if it can meet the minimum requirements for membership.

Table 8–2 shows the number of members and nonmembers of the Federal Reserve System on various dates. In 1962, there were 6049 member banks, of which 4505 were national banks and 1544 were state banks. Thus, 45 percent of all commercial banks, holding 83.7 percent of total

TABLE 8–2. Member and Nonmember Commercial Banks

Date as of June 30	Total Number of Commercial Banks	Member Banks			Non-member State Banks	Number of Member Banks as a Percentage of all Commercial Banks	Deposits at Member Banks as a Percentage of Total Deposits
		Total	National	State			
1915	25,875	7715	7598	17	18,260	29.4	49.4
1925	27,858	9538	8006	1472	18,320	34.2	72.8
1935	15,478	6410	5425	985	9,068	41.4	84.5
1945	14,003	6840	5015	1825	7,163	48.8	86.6
1950[a]	14,121	6873	4958	1915	7,248	48.7	85.7
1955[a]	13,719	6543	4692	1851	7,176	47.7	85.2
1962[a]	13,429	6049	4505	1544	7,380	45.0	83.7

[a] Data as of end of the year.

deposits in commercial banks, were members. But 7380 state banks, or 83 percent of all state chartered banks, were nonmembers. However, most of these institutions are relatively small, as is indicated by the fact that though they comprise 55 percent of all commercial banks, they account for only 16 percent of all commercial bank deposits.

There are several reasons why many state banks have failed to become

members of the Federal Reserve System.[3] Many of them cannot qualify for membership because of their inability to meet its minimum capital requirements. For example, 2389 state banks had insufficient capital for membership at the end of 1939; more than half of these, 1614, had a capital of less than $25,000. But many state banks with sufficient capital for membership have for various reasons failed to join:

1. The Federal Reserve Requirement of Par Clearance by Its Members. No member of the System may make "exchange charges" on checks forwarded to it for payment through the Reserve banks. That is, the member bank on which a check is drawn must pay the full face amount of the check to the payee or to the agencies taking the check for clearance and collection; it may not deduct any amount to cover costs of making payment.[4] But many nonmember banks, 1617 of them at the end of 1962, refuse to pay such checks at par, for they are unwilling to forgo this source of revenue in order to join the Federal Reserve.

2. Lower Reserve Requirements Under State Laws. The fact that reserve requirements for member banks are higher than those prescribed by some state laws makes some banks unwilling to join.

3. Unwillingness to Comply with Other Regulations Applicable to Member Banks. Many state banks operating under more lenient state banking laws are unwilling to comply with member bank regulations, such as the Clayton Anti-Trust Act prohibitions against interlocking bank officers, directors, and employees; restrictions on affiliates of member banks; limitations as to the types of assets acquired; limitations on a bank's loans to its executive officers; and reports required.

4. Availability of Federal Reserve Services Without Membership. With certain limitations, nonmember banks may use the Federal Reserve clearing system, and various other Federal Reserve facilities. A less generous policy toward nonmembers would probably force more banks into the System.

OWNERSHIP OF THE FEDERAL RESERVE BANKS

Another controversial question prior to the passage of the Federal Reserve Act was, "Who shall provide the capital for the Federal Reserve

[3] For an excellent discussion of this subject, see B. Magruder Wingfield, "Deterrents to Membership in the Federal Reserve System," in Board of Governors of the Federal Reserve System, *Banking Studies*, Washington, D.C., 1941, pp. 273–292.

[4] It must be noted that these "exchange charges" differ somewhat from the service charges with which we are now familiar. A member of the Federal Reserve may still charge its customers for the services it performs for them, including charges for cashing checks that are drawn on other banks. But it may not remit less than the face amount of a check drawn on it and presented to it by a Federal Reserve bank for payment.

banks?" Some wanted government ownership. Others wanted the stock to be sold to the general public, and still others wanted all stock to be sold to member banks. The solution was a compromise. Each member bank is required to subscribe to the stock of its Federal Reserve bank in an amount equal to 6 percent of its own paid-up capital and surplus. It was provided, however, that stock would be offered to the public if insufficient capital was obtained from this source; and if subscriptions by the banks and the public were insufficient, stock would be sold to the federal government. In reality, no stock of the Federal Reserve banks has been sold to either the public or the government, and even the member banks have been required to pay in only half of their subscriptions. Thus, the Federal Reserve Banks are owned wholly by their member banks, each member bank having paid in to its Federal Reserve bank an amount equal to 3 percent of its own paid-up capital and surplus.

It is important to note, however, that in this case, ownership does not carry with it control of the corporation and enjoyment of all its earnings. (The distribution of control is discussed in the next section.) Annual dividends to stockholders of the Reserve banks are limited to 6 percent of the paid-in capital stock. The remainder of Reserve bank earnings has been used to build up the surplus accounts of the Reserve banks and to provide revenue for the Treasury. Prior to 1933, each Reserve bank was required by law to pay the Treasury a franchise tax equal to 90 percent of its net earnings in excess of dividends after it had accumulated a surplus equal to its subscribed capital. By the end of 1932, the Reserve banks had accumulated surplus accounts amounting to $278 million and had paid $149 million in franchise taxes to the Treasury. The Banking Act of 1933 required the Reserve banks to pay half of their accumulated surplus, or $139 million, as a subscription to the capital stock of the Federal Deposit Insurance Corporation; in return, the Act repealed the franchise tax in order to enable the Reserve banks to use all their earnings in excess of dividend requirements to replenish their surplus accounts. By the end of 1946 the Reserve banks had built up their combined surplus accounts to nearly $440 million. Partly because of this the Board of Governors in April, 1947, voluntarily put into operation a plan to channel into the Treasury most of the Reserve bank earnings in excess of their dividend requirements.[5] In recent years all Federal Reserve earnings in excess of dividend requirements have been transferred to the Treasury through an interest charge on outstanding Federal Reserve notes levied by the Board of Governors.

[5] *Federal Reserve Bulletin*, May, 1947, pp. 518–519. The authority for this action by the Board is found in Section 16, paragraph 4, of the Federal Reserve Act.

CONTROL OF THE FEDERAL RESERVE SYSTEM

Closely related to the heated controversies over the structure of the Federal Reserve System were those concerning its control. The most widely debated questions were: (1) Who should control the Federal Reserve? (2) Should control be centralized or decentralized? Three principal groups wanted a voice in control—the federal government, member banks, and businessmen who were customers of member banks. Some, arguing that central banking is essentially a governmental function and that one of its principal objectives is the regulation of member banks, demanded full government control. On the other hand, many bankers who looked upon the new Reserve banks as essentially cooperative institutions for member banks demanded that full control be placed in the hands of bankers, although small banks feared domination by their larger competitors. Others argued that businessmen as customers of banks should be given a voice. No less heated were the discussions concerning the degree of centralization of control. Some wanted almost complete centralization, whereas others demanded a large degree of regional autonomy.

Here, too, the issue was settled by compromise. All the competing groups were given representation, and control was divided between a central authority in Washington and the regional Federal Reserve banks. In the succeeding sections we shall describe the present system of control. It should be remembered, however, that the original division of authority proved unsatisfactory in many respects and that it has been changed in several ways during the period since 1914. In general, the evolution has been toward greater centralization of authority and a greater degree of control by the federal government.

The Board of Governors of the Federal Reserve System

The central controlling authority, which has its offices in Washington, is the Board of Governors of the Federal Reserve System. This Board is composed of seven members (each called a governor) appointed by the President of the United States with the advice and consent of the Senate. Each member devotes his full time to the Board, is appointed for a term of 14 years, and is ineligible for reappointment if he has served a full term.[6] No more than one member of the Board may be selected from any one Federal Reserve district, and in making appointments, the President

[6] Prior to 1935, this body was known as the Federal Reserve Board. Both the Comptroller of the Currency and the Secretary of the Treasury were ex-officio members of the old Board. The Board was reconstituted in 1935, its members being given higher salaries and longer terms in order to strengthen it and centralize control to a greater degree.

is to "have due regard to a fair representation of the financial, agricultural, industrial, and commercial interests, and geographical divisions of the country." The President designates one of the members as chairman of the Board and another as vice-chairman.

Though the actual location of control has in the past depended greatly on economic and political conditions and on the forcefulness of the various personalities involved, the Board of Governors is now clearly the most powerful controlling force in the entire Federal Reserve System. Among its most important powers are the following:

1. To exercise general supervision over the Federal Reserve banks, to examine their accounts and affairs, and to require reports by them.
2. To approve or disapprove appointments to the positions of president and first vice-president of each Federal Reserve bank and to suspend or remove any officer or director of any Federal Reserve bank.
3. To supervise the issue and retirement of Federal Reserve notes by each Federal Reserve bank.
4. To serve as a majority of the members of the Federal Open-Market Committee.
5. To permit one Reserve bank to lend to another, and by a vote of at least five members of the Board to require it to do so.
6. To suspend the reserve requirements applicable to the Reserve banks.
7. To determine, within the broad limits prescribed by law, the types of loans that the Reserve banks may make.
8. To approve or disapprove discount rates established by the Reserve banks.
9. To fix, within the limits established by law, member bank reserve requirements.
10. To regulate loans on securities.

Though this list is far from complete, it indicates the general scope of the Board's authority.

Federal Open-Market Committee

As we shall see later, one of the most powerful instruments of credit control in the hands of the Federal Reserve System is its power to buy and sell government securities, acceptances, and other obligations in the open market. The Reserve banks can create additional member bank reserves by purchasing obligations in the open market and can contract member bank reserves by selling securities. The original Federal Reserve Act was vague as to who should control this function, with the result that the individual Reserve banks sometimes followed conflicting policies and sharp controversies arose within the System. Attempts were made to solve the problem in the 1920s by creating an informal open-market committee made up of representatives of the Federal Reserve banks, but these efforts were only partially successful. Some Reserve banks com-

plained that they were not adequately represented; others ignored the decisions of the informal committee; and the Board in Washington felt that it should have more control of this function.

The Federal Open-Market Committee was created by amendments to the Federal Reserve Act to clarify the location of authority and to centralize the control of Federal Reserve open-market operations.[7] It is composed of 12 members; 7 of these (a majority) are members of the Board of Governors of the Federal Reserve System and 5 are representatives of the Reserve banks. The latter are elected annually, must be either presidents or vice-presidents of Reserve banks, and are elected by the board of directors of the various Reserve banks, each board having one vote. The distribution of the five Reserve bank representatives as follows:

One from the Federal Reserve Bank of New York
One from the Federal Reserve Banks of Boston, Philadelphia, and Richmond
One from the Federal Reserve Banks of Atlanta, Dallas, and St. Louis
One from the Federal Reserve Banks of Minneapolis, Kansas City, and San Francisco
One from the Federal Reserve Banks of Cleveland and Chicago

Because of its key position, the New York Bank is always represented on the Committee.

> The Federal Reserve Bank of New York occupies a unique position with respect to the Federal Reserve System, the Treasury, and the banking system of the country. Its resources total approximately 40 percent of the aggregate of the twelve Federal Reserve Banks. It is located at the central money market and at the principal market for Government securities; its operations as fiscal agent of the United States and its transactions with foreign governments, foreign central banks and bankers, as well as its operations in foreign exchange, are in far greater volume than those of any other Federal Reserve Bank. It is clearly in the public interest that the Federal Open-Market Committee be given at all times the benefit of counsel of the Federal Reserve Bank which is in constant touch with the domestic and international money and capital markets and has had long experience in these fields.[8]

The Federal Open-Market Committee has full control of all open-market purchases and sales by the Reserve banks. No Reserve bank may engage or decline to engage in open-market operations except in accordance with the regulations adopted by the Committee. The Committee was also given jurisdiction over Federal Reserve purchases and sales of foreign exchange soon after these began in the early 1960s.

[7] The first Federal Open-Market Committee was established by amendment to the Federal Reserve Act in 1933. The Committee was reconstituted by further amendments in 1935, and minor changes have been made since that time.

[8] *Federal Reserve Bulletin*, August, 1942, pp. 740–741.

Federal Advisory Council

The Federal Advisory Council is composed of 12 members, one being selected by the board of directors of each Reserve bank. The sole function of this Council is to act in an advisory capacity to the Board of Governors. The only sources of its power are its eloquence and the prestige of its members, most of whom are prominent men.

Control of Individual Federal Reserve Banks

Control of each of the 12 Federal Reserve banks is divided among the member banks in the district, businessmen in the district, and the Board of Governors of the Federal Reserve System. Each Reserve bank has a board of directors with nine members. Three of these are known as Class A directors, three as Class B directors, and three as Class C directors. The Class A directors represent the member banks of the district and are chosen by them. To prevent domination of the Reserve bank by any one banking group, the member banks of the district are divided into three groups based on size, and each group elects one Class A director. The Class B directors represent industry, commerce, and agriculture in the district and must be actively engaged in one of these pursuits at the time of their election. They may not be officers, directors, or employees of any bank. They are, however, elected by the member banks of the district in the same way as the Class A directors. All three of the Class C directors are appointed by the Board of Governors. One of these, who must be "a person of tested banking experience," is chairman of the board of directors and "Federal Reserve Agent" at the bank. As Federal Reserve Agent, he acts as official representative of the Board of Governors in carrying out its legal functions. Another Class C director at each Reserve Bank acts as deputy chairman of the board of directors.

The chief executive officer of each Reserve bank is its president, who is appointed by its board of directors with the approval of the Board of Governors. The first vice-president of each Reserve bank is appointed in the same way. Other Reserve bank officers and employees are appointed by the bank's board of directors, though they may, of course, be removed by the Board of Governors.

After a long period of doubt as to the proper location of authority in the Federal Reserve System, it is now clear that the Board of Governors occupies the dominant position. Some power still rests with the representatives chosen by member banks, but the Board of Governors has many sources of power:

1. Exclusive regulation of many Federal Reserve and commercial bank functions is in the hands of the Board.

2. Its members make up a majority of the members of the powerful Federal Open-Market Committee.
3. The Board appoints three members of the board of directors of each Reserve bank, one of its appointees at each bank being chairman of the board of directors and Federal Reserve Agent.
4. The Board may disapprove appointments of presidents and first vice-presidents of the Reserve banks and remove directors, officers, and employees.

SUMMARY OF THE PRESENT STRUCTURE OF THE FEDERAL RESERVE SYSTEM

Board of Governors	Located in Washington, composed of 7 members appointed by the President.
Federal Open-Market Committee	12 members, including the Board of Governors and 5 representatives of the Reserve banks.
12 Federal Reserve Banks	Each separately incorporated, each located in an important city, each with a board of directors of 9 members, and each with its president and other officers.
24 Branches of the Federal Reserve Banks	To facilitate the functioning of the Federal Reserve banks of their districts.
Member Banks	About 6000 banks (mostly commercial banks), of which about 4500 are national banks and about 1500 are state banks. These banks hold about 84 percent of all commercial bank assets and by their magnitude can dominate commercial banking operations in this country. It is largely through its effects on member banks that the Federal Reserve can control the credit policies of nonmember commercial banks.

PROPOSALS FOR CHANGE

It would be rash indeed to assume that the evolutionary development of the Federal Reserve has now ended and that the System will continue unchanged for an indefinite period. There are still heated controversies over both the structure and the control of the System, and these tend to center around membership and control. Most Federal Reserve officials, and probably a majority of monetary economists, believe that all commercial banks should be required to become members of the Federal Reserve, or at least be required to hold reserves equal to those of comparable classes of member banks. They contend that monetary management is a responsibility of the federal government and that the freedom of state-

chartered banks to abstain or withdraw from membership tends to weaken the Federal Reserve in performing the functions delegated to it by Congress. This is especially true when the Federal Reserve attempts to raise member bank reserve requirements considerably above those of nonmember banks, but it applies to some other Federal Reserve actions as well. Such actions tend to put member banks at a competitive disadvantage relative to nonmembers, to create discontent and threats of withdrawal among members, and to lessen the willingness of Federal Reserve officials to apply appropriate restrictive measures to members. For these reasons, it has been proposed several times that, as a minimum, nonmembers should be required to hold reserves as high as those of member banks, and there is considerable support for legislation to require all commercial banks to join the Federal Reserve.

To these proposals there is strong opposition, especially from bankers and state bank commissioners. These opponents bolster their position with several arguments:

1. The Federal Reserve already has adequate credit control powers, since its members hold about 84 percent of total commercial bank assets and deposits. Moreover, the presence of nonmembers is disadvantageous only when the Federal Reserve tries to increase reserve requirements of members to excessive levels, and this should not be done anyway.

2. Such an extension of federal power would violate states' rights, in this case the right of states to regulate the banks that they charter.

3. The ability of banks to abstain from Federal Reserve membership or to withdraw if already in the System is a desirable part of our governmental system of "checks and balances"; it acts as a check on the severity of Federal Reserve actions.

4. A requirement that all banks hold their reserves in the form of deposits at the Federal Reserve would cause some of the bigger banks to lose at least part of their profitable interbank deposits. The opposition to both universal membership and the extension of federally determined reserve requirements to all commercial banks is by no means confined to bankers whose institutions are now outside the System.

The location of control over Federal Reserve activities also continues to be a subject of intense controversy. Involved here are both the relation of the Federal Reserve to the executive branch of the government and the distribution of control within the System. The Federal Reserve is based on the principle of "independent central banking." It is, of course, responsible to Congress; it was created by Congress, must make reports to Congress, and Congress can at any time change its basic

legislation, give it directives, or even abolish it. It is not, however, responsible to the executive branch. This "independence" from the executive branch is based on several considerations:

1. The administration in power is likely to have an easy-money inflationary bias, partly because easy money and mild inflation tend to be popular and to increase the ability of the incumbent political party to remain in power, and partly because the Treasury is likely to insist on easy money and low interest rates to keep down interest charges on the national debt and to facilitate its refunding and new borrowing operations.

2. Control of the central bank is likely to inject "politics" into that bank's operations: patronage, discrimination on the basis of party affiliation, and so on.

3. Successful monetary management requires greater continuity among top officials than would be likely to result from responsibility to the President, whose term may not last more than four years.

4. The existing arrangement elicits from the commercial banks more confidence and cooperation than they would give to a "politically dominated" institution.

On the other hand, several arguments are advanced for terminating the "independence" of the Federal Reserve and for making it responsible to the executive branch:

1. Monetary policy, like other governmental policies, should be controlled by people responsible to the electorate.

2. The present arrangement makes difficult the appropriate coordination of monetary policy with the other economic policies of the government. It is intolerable that the Federal Reserve should follow policies in conflict with those determined by the elected representatives of the people.

3. Especially serious are the overlapping of powers and the conflict of interest between the Federal Reserve and the Treasury during inflation periods. At such times, the debt management policies of the Treasury, when it emphasizes low interest rates, are in conflict with the Federal Reserve objective of curbing inflation. Some people would resolve this conflict between institutions, if not between objectives, by making the Federal Reserve responsible either to the Treasury or to the President. Others, however, would secure coordination by instructing the Treasury to adjust its debt management policies to the monetary policies of the Federal Reserve.

It is still too early to forecast the outcome of this controversy over the relationship between the Federal Reserve and the executive branch.

Some method of achieving better coordination of monetary, debt management, and other economic policies is clearly needed. But it is to be hoped that the tradition of an "independent" central bank will not be discarded without full consideration of the resultant dangers.

Less intense, but nevertheless important, are the continuing controversies over the location of control within the Federal Reserve System. Some who believe that centralization has gone too far would transfer some power back to the Reserve banks, or at least from the Board to the Federal Open-Market Committee on which the Reserve banks are represented. Others would concentrate still more power in the Board.

Such proposals as these have been advanced in recent years:

1. Reduce the number of members of the Board of Governors from seven to no more than five. The primary purpose of this would be to increase the prestige of the Board and attract to it more able people. Other possible benefits are a greater concentration of responsibility and more flexible decision-making.

2. Abolish the Federal Open-Market Committee, remove from the Reserve banks their last vestige of control over discount policy, and vest in the Board of Governors complete authority over discount policy, open-market policy, foreign-exchange policy, and member-bank reserve requirements. The boards of directors and executive officers of the 12 Reserve banks would then be responsible for carrying out the policies laid down by the Board of Governors, but their role in policy-making would be purely advisory.

3. Retire the Federal Reserve stock now held by member banks, and with it, all the power of member banks to elect members of the boards of directors of the Reserve banks. This, it is expected, would leave the banks with no more control over monetary policy than they could achieve as members of the community.

None of these proposals has been adopted, and all remain controversial. If all were adopted, we should have in fact, if not in form, a single central bank.

FEDERAL RESERVE "CHORES"

Having examined the structure and control of the Federal Reserve System, we can now begin to study its functions. We shall look first at its functions other than those of monetary and credit management. For brevity these will be called "chores." But these chores are not merely incidental or unimportant functions. Collectively, they account for the

great bulk of work within the Federal Reserve. And in performing these chores, the Federal Reserve has contributed greatly to the efficiency and convenience of the banking system.

Banking Supervision

The supervision and examination of banking in this country are not exclusively a Federal Reserve function, but are shared with several other authorities. The Comptroller of the Currency has jurisdiction over all national banks. State banking authorities have jurisdiction over state banks. And the Federal Deposit Insurance Corporation has jurisdiction over all banks with deposit insurance, which includes all members of the Federal Reserve System and most nonmembers. Each Reserve bank has its staff of bank examiners, and member banks must make periodic reports as to their condition. In addition to requiring reports and examining member banks, the Federal Reserve exercises other important supervisory powers, among which are the powers to:

1. Fix maximum rates of interest that member banks may pay on time and savings deposits. The principal purpose of this limitation is to prevent banks from bidding these rates so high as to weaken their condition.[9]
2. Remove officers and directors of member banks for continued violation of banking laws or for continued unsafe or unsound banking practices.
3. Suspend a member bank's borrowing privileges at the Federal Reserve if it is found to be making undue use of bank credit for speculation in securities, real estate, or commodities.
4. Permit national banks, where appropriate, to exercise trust powers.
5. Permit holding companies, when it is not against the public interest, to vote the stocks of member banks controlled by them.
6. Permit member banks to establish branches in foreign countries.

Though the Federal Reserve has undoubtedly helped raise the quality of banking through its supervision and examination, its success has been limited. One reason for this is the principle of optional membership for state-chartered banks, which has permitted more than 80 percent of these banks to remain nonmembers. Unfortunately, many of these banks are located in states in which banking laws and supervision are least satisfactory and improvement most needed. Thus, federal efforts to improve bank supervision were seriously hampered until after the banking collapse in 1933. The situation was much improved by the establishment, in the mid-1930s, of the Federal Deposit Insurance Corporation, which insures deposits of only those banks that submit to its jurisdiction, super-

[9] Banks are not allowed to pay interest on demand deposits.

vision, and examination. Fortunately, only about 300 banks, most of them small, have remained noninsured.

Overlapping jurisdictions of the chartering, supervisory, and examining authorities remain a problem despite the degree of cooperation achieved. These agencies sometimes conflict with each other, differ in their administrative interpretations if not in basic principles, and enable banks to "play off one agency against another." To eliminate the overlapping of federal and state jurisdictions may be politically infeasible. But many think it desirable, and perhaps politically possible, to eliminate at the federal level the overlapping jurisdictions of the Comptroller of the Currency, the Federal Reserve, and the Federal Deposit Insurance Corporation. Some suggest that all supervisory and examination powers should be vested in one of the existing agencies. Others think they should be concentrated in a newly created agency, which might also have jurisdiction over other types of financial institutions.

Clearing and Collection of Checks

The Federal Reserve System has greatly enhanced the speed, convenience, and cheapness of clearing and collecting checks and other similar items. Before 1914 a check might spend two weeks or more in the process of being cleared and collected, especially if it had to move long distances. The maximum time now required is only a few days, and banks that clear checks through the Federal Reserve receive payment in two days or less. The whole process is completed with virtually no shipment of coin or currency. Deposit accounts at the Federal Reserve banks play a central role in this process. All member banks must hold deposit claims against their Federal Reserve banks, to meet their legal reserve requirements. Many nonmember banks have deposits at the Federal Reserve for clearing purposes. This permits banks to make or receive net payments through the transfer of deposit credits on the books of the Federal Reserve.

To illustrate the high development of the clearance and collection system for checks and other similar instruments, let us look at the process in a few typical situations. The processes often vary in detail from those described below, but the principles involved are similar. Let us suppose that Smith deposits with the First Hartford Bank in Connecticut a check for $100 given him by Jones. If Jones' check is drawn on the First Hartford Bank, the process of clearance is simple; the bank merely adds $100 to Smith's deposit account and deducts $100 from Jones' account.

Suppose, however, that Jones has written the check on another bank in the same city, the Second Hartford Bank. After Smith has deposited

the check with the First Hartford Bank, it may be cleared in either of two general ways. The two banks may informally exchange their claims against each other at the end of the day, the net debtor then paying the other bank with a check drawn on another bank, probably the Federal Reserve bank of the district. Final payment is thus made by transferring a deposit credit at the Federal Reserve from the account of the Second Hartford Bank to that of the First Hartford Bank. Or the banks may clear and collect checks through a local clearing house. Each bank in the area takes to the clearing house at an appointed time each day all the checks and other matured claims that it has against the other members of the clearing house. There clearing house officials compare the total amounts of checks presented by each bank against all other banks with the total amount of checks presented by all other banks against it, and then pay it the net amount due it or collect the net amount owed by it. These net payments are usually made with checks, often with checks drawn on the Reserve bank of the district. Actual coin or currency is almost never used to pay net differences at a clearing house.

If the check Jones gives to Smith is drawn on a bank located in another city in the same Federal Reserve district (say, in Springfield, Massachusetts), the clearance and collection procedure is somewhat as follows: Smith deposits the check with the First Hartford Bank, which credits his account and sends the check along with others to the Federal Reserve Bank of Boston for clearance and collection. The Boston Reserve bank then sends the check to Springfield, and the Springfield bank deducts the amount of the check from Jones' deposit account. After the lapse of sufficient time for notification if the check is not good, the Boston Reserve bank deducts the amount of the check from the Springfield bank's reserve account with it and adds the same amount to the Hartford bank's reserve account. Payment of the check has been achieved quickly and with no shipment of coin or currency.

The procedure is only slightly more complicated if Jones' check is drawn on a bank in another Federal Reserve district, say, on the Los Angeles Commercial Bank. Smith deposits the check with the Hartford bank, which credits his deposit account and sends the check along with others to the Federal Reserve Bank of Boston. The latter then sends the check along with others via air mail to the Federal Reserve Bank of San Francisco, which then sends it to the Los Angeles Commercial Bank. If the San Francisco bank is not notified within an appointed time that the check is bad, it deducts the amount of the check from the Los Angeles bank's reserve account with it. At or about the same time, the Boston Reserve Bank adds the amount of the check to the Hartford bank's re-

serve account. At this point Smith has been paid, Jones has paid, Smith's bank has been paid, and Jones' bank has paid. But the San Francisco bank still owes the Boston bank the amount of the check, if it has not been offset by counterclaims. How is a net balance paid between Reserve banks? This is accomplished without any shipment of coin or currency by the simple expedient of book entries in the Interdistrict Settlement Fund, which is maintained by the Board of Governors in Washington. Each Reserve bank establishes a credit in the Interdistrict Settlement Fund. Any net balance due a Federal Reserve bank at the end of a day is added to its account in the Fund, and any net claim of another Reserve bank against it is deducted from its account.

It is through arrangements of this type that payments can be made to all points within the country quickly and without the inconvenience and expense of shipping coin or currency. Federal Reserve facilities for clearing and collection are available without charge to all member banks and to all nonmembers who will remit the par value of checks drawn on them. The Federal Reserve will not, however, clear and collect checks drawn on nonmembers who refuse to pay the full face amounts of checks drawn on them. The "nonpar banks" are still an inconvenience in the banking system.

Wire Transfers of Funds

In addition to providing a rapid and efficient system for clearing and collecting checks and other similar paper, the Federal Reserve System operates highly useful facilities for the telegraphic transfer of funds. The government and bank customers as well as the banks themselves can transfer funds of any amount from one end of the country to the other almost instantaneously. Suppose, for example, that Jones in Los Angeles wishes to transfer by wire $1 million to Smith in Hartford. Jones gives his bank a check for that amount, and his bank telegraphs the Federal Reserve Bank of San Francisco, asking it to transfer the funds. The San Francisco Reserve Bank deducts the amount from the reserve account of the Los Angeles bank and telegraphs the Federal Reserve Bank of Boston, telling it to transfer the funds to Smith at the First Hartford Bank. The Boston Reserve bank adds the amount of the check to the Hartford bank's reserve account and wires the Hartford bank to credit Smith's account. The whole process is completed within minutes. The Federal Reserve Bank of San Francisco settles with the Boston bank through a transfer on the books of the Interdistrict Settlement Fund.

Through its wire transfer system, the Federal Reserve can also transfer federal government securities from one end of the country to the other

within a few minutes. Suppose, for example, that a bank in Seattle wishes to transfer $10 million of Treasury obligations to a government security dealer in New York. The bank will take the securities to the Seattle branch of the Federal Reserve Bank of San Francisco. The Seattle branch will invalidate these securities and wire the Federal Reserve Bank of New York to issue and deliver to the government security dealer the new Treasury obligations of the same issue and in the same amount. After the dealer has sold these securities, he may pay the Seattle bank through the wire transfer system.

FISCAL AGENCY FUNCTIONS

As noted earlier, one purpose of the Federal Reserve Act was to provide the United States Treasury with a more satisfactory fiscal agent. Before that time, the Treasury relied on commercial banks and on the so-called Independent Treasury System, which consisted of a number of regional suboffices of the Treasury. Both were unsatisfactory. Banks were unsatisfactory because some were unsafe, check clearing and collection were slow, and the limited geographic scope of each bank was not conducive to rapid regional transfers of government funds. The Independent Treasury System was unsatisfactory, partly because its offices were so expensive to operate. Much more serious was that net movements of coin and paper money into and out of its vaults sometimes had undesirable effects on general credit conditions. Net collections of coin and currency from the public served to reduce bank reserves and restrict bank credit, whether or not this was desirable. And net outpayments of coin and currency tended to increase bank reserves and ease credit, sometimes when such results were not wanted. Treasury officials gradually learned how to avoid such undesirable results and even to use these powers in a stabilizing way. Nevertheless, it became clear that a more efficient mechanism was needed.

In acting as fiscal agent, the Federal Reserve banks do an enormous amount of work for the federal government and its various offices and corporations. At some of the Reserve banks, the amount of work done for the government is comparable to, and even greater than, that done for the bank itself as principal. Among the functions performed by the Federal Reserve as "principal banker to the government" are:

1. Financial advisor
2. Depository and receiving and paying agent
3. Agent for issuing and retiring Treasury securities
4. Agent in other transactions involving purchases and sales of securities for Treasury account

5. Agent for the government in purchasing and selling gold and foreign exchange
6. Lender to the Treasury.

Financial Advisor

The Treasury and other government departments do not, of course, rely solely on the Federal Reserve for financial information and advice; they have their own staffs and many other sources. Yet the Federal Reserve, which is so intimately and continuously in contact with the money, securities, and foreign exchange markets, is in a position to be especially helpful to the government in its debt management and foreign exchange transactions.

Depository

The Federal Reserve banks, collectively, are in one sense the principal depository of federal government funds, for most government payments are made out of the Treasury's deposit accounts at the Federal Reserve. Yet the Treasury ordinarily holds only a small fraction of its deposit balances at the Federal Reserve; the remainder are held in thousands of commercial banks. This system was evolved to minimize disturbances to bank reserves and the general credit situation that would otherwise result as the government had large net receipts or made large net payments. During some periods, especially at the peak of tax collections or when the Treasury has sold a large issue of securities, the Treasury has large net receipts, mostly in the form of checks. If all these were put into deposits at the Federal Reserve banks, the Federal Reserve would add them to its deposit liability to the Treasury and deduct them from its deposit liabilities to the banks on which the checks were drawn. Thus the banks would lose reserves and the supply of money and credit would tend to be restricted, whether or not this was desired. At other times, especially when tax collections are small relative to expenditures, the Treasury must make large net payments to the rest of the community. If it made these payments with checks drawn on deposits built up earlier at the Federal Reserve, the payees would deposit the checks in their banks, which would in turn send them to the Federal Reserve, which would subtract them from Treasury deposits and add them to reserve accounts of the banks. This increase of bank reserves would tend to expand credit, which might or might not be desirable. We shall see later that the Federal Reserve can attempt to offset such disturbances by sales and purchases of government securities in the open market. But to do this smoothly and effectively when the disturbances are large presents difficulties.

It is largely to avoid such difficulties that the Treasury ordinarily holds most of its deposits in *tax and loan accounts* at more than 10,000 qualified commercial banks. These banks are those that want to hold Treasury deposits, have pledged government securities to assure the safety of these deposits, and have met certain other requirements. The system works as follows: A bank, or customers of a bank, send checks to the Treasury to pay taxes or to pay for securities purchased from the Treasury. The Treasury records the amounts received and routes the checks back through the Federal Reserve to the bank on which they are drawn, and the latter adds the amounts of the checks to its deposit liability to the Treasury. Note that at this stage, the bank has lost no reserves; it has merely increased its deposit liability to the Treasury, and if the checks were written by customers, has reduced its deposit liabilities to the public. In the meantime, the Federal Reserve maintains complete records of the amounts of Treasury deposits at every bank. Later, a few days before the Treasury wishes to use the deposits for payment, the Federal Reserve in its capacity as fiscal agent announces the date when a stated percentage of Treasury deposits will be called. The call states, in effect, "On the specified date, X percent of Treasury deposits will be withdrawn from your bank. On this date we shall deduct this amount from your reserve account at the Federal Reserve and you shall deduct this amount from your deposit liability to the Treasury." This tends, of course, to reduce bank reserves. However, meanwhile, the Treasury checks drawn on the Federal Reserve will have been sent to payees. As these are deposited with banks and sent by banks to the Federal Reserve, the effect is to restore bank reserves. If the timing is perfect, there will be no net change in the total volume of bank reserves, though there may be some redistribution of reserves among the banks.

Agent for the Treasury in Securities Transactions

The Federal Reserve does a tremendous amount of work for the Treasury in issuing and retiring securities and in purchasing and selling securities for trust funds and other accounts controlled by the government. When the Treasury offers new securities for sale, the Federal Reserve publicizes the issue, receives bids and subscriptions, decides which to accept and which to reject in accordance with Treasury instructions, and collects on behalf of the Treasury. As paying agent for the Treasury, it pays interest on the federal debt and redeems maturing securities. When, as sometimes happens, the Treasury offers an issue through an investment banking syndicate, the Federal Reserve serves as agent for the Treasury in making arrangements.

9. Federal Reserve Credit and Bank Reserves

Though its service functions are highly useful, the primary function of the Federal Reserve, as well as other central banks, is monetary management; that is, regulation of the supply of money and of the supply and availability of loan funds for business, consumer, and government spending. Federal Reserve powers in this area are inescapably great; by its very existence the System inevitably affects the behavior of not only financial markets but also real output, employment, and price levels. If these powers are used in an appropriate manner, the Federal Reserve can act as a powerful stabilizing force; if they are used in other ways, the system can be a potent destabilizer.

The monetary or credit management activities of the Federal Reserve are of two broad types: (1) general monetary or credit controls, and (2) selective credit controls. The immediate objective of the general controls is to regulate the total supply of money and credit; it is not to determine the allocation of the total supply of credit among the various types of borrowers or among its various possible uses, though some allocative effects may occur as an unintended by-product. The function of allocating credit is left to the private market. On the other hand, the immediate purpose of selective controls is to regulate the amount of credit used (or the terms on which credit is available) for selected purposes, such as credit extended for consumer purchases, to purchase or carry securities listed on the national exchanges, or for new residential construction. The deliberate purpose of such selective controls is to interfere with the allocative functions of private credit markets. Selective controls may also affect the total supply of credit, but this is a secondary effect. Further

discussion of selective controls will be postponed to a later chapter; the remainder of this chapter will discuss general monetary and credit controls.

GENERAL CONTROLS

In an earlier chapter, we found that the volume of deposits that commercial banks can create and have outstanding, and also the volume of earning assets that they can acquire and hold, depend on (1) the dollar volume of legal reserves available to the banks, and (2) the height of their legal fractional reserve requirements against deposits. Every dollar of legal reserves is "high-powered money" in the sense that each dollar of reserves can support several dollars of commercial-bank deposits. But how "high powered" each dollar of reserves is depends on the height of legal reserve requirements.

To carry out its function of general monetary and credit management, the Federal Reserve has powers to control both the height of reserve requirements and the volume and cost of bank reserves. As we have already seen, the Federal Reserve Act provides that only two types of assets can be counted as legal reserves for member banks: deposits at the Federal Reserve and cash in vault. Moreover, it empowers the Board of Governors to alter, within specified limits, the percentage reserve requirements against deposits in member banks. By raising the level of these requirements, the Board can inhibit the creation of money by the banking system and exert an antiexpansionary or even a contractionary influence. By lowering these requirements, the Board can permit and even encourage an expansion of money and credit. We shall see later that this is a powerful instrument which the Board sometimes uses.

However, the Federal Reserve relies more continuously on its power to regulate the volume and cost of reserves available to the commercial banking system. The remainder of this chapter will discuss the factors determining the volume of bank reserves and the processes through which the Federal Reserve creates and destroys these reserves. We shall emphasize Federal Reserve control of the money-creating and money-destroying activities of the commercial banks. However, it should be noted that in this process, the Federal Reserve can itself create and destroy money. For example, when the Federal Reserve makes net purchases of assets, it creates and issues funds that usually appear somewhere in the money supply. And when it makes net sales af assets, it can directly decrease the money supply.

FEDERAL RESERVE BALANCE SHEETS

An analysis of the combined balance sheets of the 12 Federal Reserve banks will help us understand the processes through which the Federal Reserve increases or decreases the reserves of the commercial-banking system. We start with basic balance sheet equations of the type developed in Chapter 4:

(1) Assets = liabilities + capital accounts
(2) Liabilities = assets − capital accounts

"Assets" include everything of value owned by the Federal Reserve banks at the stated point of time. "Liabilities" are debt claims against the Federal Reserve banks. "Capital accounts," or net worth, are the ownership claims against the Federal Reserve banks. At any point of time, the Federal Reserve banks must have outstanding a total of debt claims and ownership claims exactly equal to the value of their assets. If they make net increases in their assets, they must pay for these assets by creating and issuing an equal net increase in debt and ownership claims against themselves. And if they decrease their total asset holdings, they must withdraw and retire an equal amount of outstanding debt and ownership claims against themselves.

An examination of the Federal Reserve balance sheet in Table 9–1 reveals that the Reserve banks have paid for only a very small fraction, less than 3 percent, of their assets by issuing capital account, or net worth, claims. Moreover, the total of these net-worth claims rises only slowly through time, reflecting mostly new stock subscriptions by member banks equal to about 3 percent of increases in the paid-up capital and surplus of member banks. Thus, the Reserve banks pay for their assets largely by issuing debt claims against themselves, and they withdraw and retire debt claims when they decrease their total assets.

FEDERAL RESERVE NOTES AND DEPOSITS

Federal Reserve liabilities are largely of two types: Federal Reserve notes and deposit liabilities. As indicated earlier, Federal Reserve notes make up the great bulk of paper money in the United States. Though impressively engraved and endowed by law with full legal-tender powers, they are nothing but debt claims against the Federal Reserve banks. Deposits at the Federal Reserve banks are also merely debts owed by the Federal Reserve. They are evidenced by book entries. Table 9–1 indicates that the Federal Reserve issues deposit claims against itself to only a few types of holders. It will not accept deposits from individuals,

businesses, or state and local governments. Most of its deposit liabilities are to member banks. These serve both as legal reserves for member banks and as a medium for clearing and collection, as noted earlier.

TABLE 9–1. Balance Sheet of the Federal Reserve Banks, June 12, 1963
(in millions)

ASSETS		LIABILITIES AND CAPITAL ACCOUNTS	
Gold certificates	$15,517	Federal Reserve notes	$30,239
Cash	343	Deposits due:	
Discounts and advances	255	Member banks	16,669
Acceptances	42	U.S. Treasury	634
U.S. government securities	31,692	Foreign	219
Cash items in process of collection	5,423	Other	243
Other assets	447	Total deposits	$47,765
Total assets	$53,719		
		Deferred availability:	
		Cash items	4,165
		Other liabilities	81
		Capital accounts	1,469
		Total liabilities and capital accounts	$53,719

Addendum:

Uncollected items	$5,423
Minus: Deferred availability cash items	4,165
Equals: Float	$1,258

SOURCE: *The New York Times*, June 14, 1963, p. 42.

Smaller deposit liabilities are owed to the federal government, to nonmember banks for check-clearing purposes, and to foreign central banks. It should be evident that member-bank deposits at the Federal Reserve may be decreased as these deposits are shifted to the ownership of other depositors at the Federal Reserve, and that member-bank deposits at the Federal Reserve may be increased as other depositors at the Federal Reserve transfer these deposits to the ownership of member banks.

Changes in the volume of Federal Reserve notes outstanding reflect changes in the demand for paper money to be held in commercial bank vaults or to be used as currency in circulation, predominantly the latter. Whenever the public wants more currency, the commercial banks are the first to feel the impact. Customers write checks on their deposit accounts and withdraw cash. The banks may supply the currency out of their cash in vault, thereby losing legal reserves in this form, or they may get it by drawing down their deposits at the Federal Reserve. In the latter case, the increase in Federal Reserve notes outstanding is at the

expense of member-bank deposits at the Federal Reserve. On the other hand, when the public wishes to hold less paper money, it deposits the excess at commercial banks, which may either add it to their legal reserves in the form of cash in vault or send it along to the Federal Reserve. In the latter case, the Federal Reserve retires the net inflow of Federal Reserve notes and adds an equal amount to its deposit liabilities to banks.

This brings out several important points. (1) It indicates how the volume of Federal Reserve notes is made responsive to the public's demand for paper money. (2) It shows that increases in Federal Reserve notes outstanding tend initially to be at the expense of bank deposits at the Federal Reserve, and that decreases in Federal Reserve notes outstanding tend initially to increase the volume of bank deposits at the Federal Reserve. (3) It suggests why we are justified in assuming that when the Federal Reserve makes net purchases of assets, it initially pays for them by creating deposit claims against itself; and when it makes net sales of assets, it initially collects by withdrawing an equal value of its deposit liabilities. For simplicity of exposition we shall assume in the succeeding sections that when the Federal Reserve purchases assets, it makes payment by adding to the reserves of commercial banks; and that when it sells assets, it collects by deducting from the reserve balances of commercial banks.

FEDERAL RESERVE ASSETS

It should be emphasized that the Federal Reserve banks can create or destroy their own deposit liabilities by purchasing or selling any kind of asset whatsoever. Thus, they can create deposit liabilities to pay for land, buildings, equipment, services, or any sort of claim against others. Or they can withdraw their deposit liabilities by making net sales of any kind of asset. This point should be borne in mind, for even now the Federal Reserve makes several kinds of purchases and sales and it might in the future broaden the categories of assets in which it deals.

It will be useful to distinguish between two types of Federal Reserve purchases and sales of assets:

1. Transactions with Member Banks. When the Federal Reserve purchases assets from a member bank, it pays that bank by adding to its reserve account. When it sells an asset to a member bank, it collects payment by reducing the bank's reserve account.

2. Transactions with the "Public." When the Federal Reserve buys an asset from the "public"—from an individual, business firm, or state or local government—it usually pays with a check drawn on a Federal Re-

serve bank. The seller of the asset usually deposits the check at a commercial bank, receiving in return a deposit credit there, and the commercial bank then sends the check to its Federal Reserve bank, which adds the amount of the check to the commercial bank's reserve account. Thus, Federal Reserve purchases of assets from the "public" tend to increase directly both the public's money supply and commercial-bank reserves. Federal Reserve sales of assets to the public have the reverse effects. When a member of the public buys an asset from the Federal Reserve, he usually pays with a check drawn on a commercial bank. The Federal Reserve deducts the amount of the check from the commercial bank's reserve account and sends the check to the commercial bank, which deducts its amount from the customer's deposit account. Thus, a Federal Reserve sale of an asset to the public tends to reduce directly both the public's money supply and commercial-bank reserves. The effect on commercial-bank reserves is, of course, the more important, for each dollar of change in commercial-bank reserves may induce, or even force, several dollars of change in the commercial banks' loans, investments, and deposit liabilities.

Though the Federal Reserve can create or destroy commercial-bank reserves by buying or selling assets of any kind, Table 9–1 indicates that, in practice, Federal Reserve purchases and sales are largely confined to a few types of assets. We shall now examine these assets, and the ways in which they are acquired and sold by the Federal Reserve.

Gold Certificates

These assets of the Federal Reserve are simply claims against the nation's monetary gold stock, all of which is owned by the United States Treasury. Only the Federal Reserve may hold gold certificates, and their volume is approximately equal to the value of the nation's monetary gold stock. When the Treasury makes net purchases of gold, it normally makes payment in the first instance by creating and issuing to the Federal Reserve an equal value of gold certificates. And when the Treasury makes net sales of gold, it normally retires an equal amount of gold certificates. Some of these "gold certificates" are pieces of paper evidencing claims against the Treasury. However, most of them are evidenced only by an entry called "Gold Certificate Account" on the liability side of the Treasury's balance sheet. But, however evidenced, gold-certificate claims are assets of the Federal Reserve banks. Since the volume of these outstanding is approximately equal to the nation's monetary gold stock, all of which is held by the Treasury, we shall now look at Treasury purchases and sales of gold. Most of these transactions are actually carried out by the Federal Reserve acting as agent for the Treasury.

Before 1933, the United States was on an unlimited gold coin standard. All types of money were freely convertible into gold coins, gold certificates, or gold bullion on demand, and there were no legal restrictions on holding or dealing in gold. Though the public actually demanded only small amounts of gold and gold certificates, large amounts of these were held by the Federal Reserve. All this was changed by government actions in 1933 and early 1934. Since the effective date of the Gold Reserve Act of 1934, the United States has been on a "limited gold bullion standard." Several aspects of this arrangement are relevant to our purpose here:

1. All gold and gold certificates, including Federal Reserve holdings, were nationalized at the old official price of $20.67 per ounce of fine gold. The Federal Reserve was paid with a new type of gold certificate, and others were paid with checking deposits.
2. No one subject to the laws of the United States, other than the Treasury, may hold or deal in gold without a license, and those who are licensed must abide by Treasury regulations. Generally speaking, Americans are permitted to hold only so much gold as is needed for industrial, scientific, and artistic purposes.
3. Only the Federal Reserve banks may hold gold certificates.
4. The Treasury stands ready to buy at approximately $35 an ounce all gold offered to it.[1]
5. The Treasury stands ready to sell at a price of approximately $35 an ounce all the gold demanded from it for legal purposes.

Note that, because the Treasury is a willing and passive buyer of gold at a fixed price and a passive seller for legal uses at a fixed price, it has no direct control over the volume of its holdings of monetary gold. And the Federal Reserve has no direct control over the volume of its assets in the form of gold certificates.

In purchasing and selling gold, the Treasury deals with two broad classes of sellers and buyers: (1) Americans, and (2) foreign central banks and international institutions. Purchases from Americans are usually very small because only limited supplies are forthcoming from domestic gold-mining and melting of gold scrap. Sales to Americans are usually small because of the restrictiveness of Treasury regulations. Nevertheless, these transactions can be used to illustrate the normal effects of Treasury purchases and sales of gold. Suppose that an American gold miner or melter of scrap offers $10 million of gold, which is purchased by the Federal Reserve for the account of the Treasury. Let us trace out in two steps the direct effects. Step 1: The gold becomes an asset of the Treasury,

[1] More precisely, the Treasury's buying price is $35 an ounce less ¼ of 1 percent service charge, and its selling price is $35 plus ¼ of 1 percent service charge.

which issues $10 million of gold certificates to the Federal Reserve, which adds $10 million to the Treasury's deposit account at the Federal Reserve. Step 2: The Treasury writes a check for $10 million on its deposit at the Federal Reserve and sends the check to the gold seller; the latter deposits the check in a commercial bank, which sends it to the Federal Reserve, which deducts $10 million from the Treasury's deposit and adds it to the bank's deposit account at the Federal Reserve. All this appears on the various balance sheets as follows:

	TREASURY		FEDERAL RESERVE BANKS		COMMERCIAL BANKS	
Step	A	L	A	L	A	L
1	gold stock + \$10	gold cert. + \$10	gold cert. + \$10	Treas. dep. + \$10		
2	...	...	...	Treas. dep. − \$10 due banks + \$10	reserve + \$10	deposits due public + \$10
Net direct effects	gold stock + \$10	gold cert. + \$10	gold cert. + \$10	deposits due banks + \$10	reserve + \$10	deposits due public + \$10

Thus, the normal direct effects of a net purchase of gold by the Treasury are to increase by equal amounts (1) the public's money supply, (2) commercial-bank reserves, and (3) Federal Reserve holdings of gold certificates, which are legal reserves for the Federal Reserve banks. Note that these are only the direct effects; further effects may be induced by the increase of commercial-bank reserves.

Net sales of gold by the Treasury to Americans normally have exactly the opposite direct effects. Suppose, for example, that a jeweler buys $5 million of gold from the Treasury, paying with a check drawn on a commercial bank. The Treasury will send the check to the Federal Reserve to retire $5 million of gold certificates; the Federal Reserve will deduct $5 million from its deposit liability to the bank on which the check is drawn and send the check to the bank; and the bank will deduct $5 million from the jeweler's deposit account. Thus the direct effect of the $5 million net sale of gold by the Treasury to Americans has been to decrease by equal amounts (1) the public's money supply, (2) commercial-bank reserves, and (3) Federal Reserve assets in the form of gold certificates. The reader should verify this by tracing out the effects on the balance sheets of the commercial banks, the Federal Reserve, and the Treasury.

By far the largest part of Treasury purchases and sales of gold is not with Americans but with official foreign and international institutions. It ordinarily refuses to deal with foreign private individuals and business firms, and confines its transactions to foreign central banks and to such international organizations as the International Monetary Fund and the Bank for International Settlements. The primary purpose of these gold transactions is to affect the supply of dollars in foreign exchange markets, and thereby the exchange rate on the dollar. In purchasing gold from a foreign central bank, the Treasury supplies it with dollars, and thus tends to lower, or at least to reduce the rise of, the exchange rate on the dollar. And in selling gold to a foreign central bank for dollars, the Treasury serves to reduce the supply of dollars in exchange markets, thereby tending to support the exchange rate on the dollar. However, at this point we are interested primarily in the effect of such Treasury purchases and sales of gold on monetary and credit conditions in the United States. These are similar to the effects of Treasury gold transactions with Americans.

Suppose that the Federal Reserve, acting as agent for the Treasury, purchases \$100 million of gold from a foreign central bank, perhaps the Bank of France. Again, let us analyze this in two steps. Step 1: The Treasury adds the gold to its assets, creates and issues an equal amount of gold certificates to the Federal Reserve, and the latter adds \$100 million to its deposit liabilities to the Bank of France. On the balance sheets this will appear as follows:

	TREASURY		FEDERAL RESERVE		COMMERCIAL BANKS	
Step	A	L	A	L	A	L
1	gold cert. + \$100	gold cert. + \$100	gold cert. + \$100	deposits due Bank of France + \$100		
2	. . .	. . .	. . .	deposits due Bank of France − \$100 deposits due U.S. banks + \$100	reserves + \$100	deposits + \$100
Net direct effects	gold stock + \$100	gold cert. + \$100	gold cert. + \$100	deposits due U.S. banks + \$100	reserves + \$100	deposits + \$100

Note that as long as the Bank of France continues to hold the proceeds of the gold sale as a deposit at the Federal Reserve, there will be no effect on either the public's money supply or on the volume of bank reserves, though there will be an increase in the Federal Reserve's gold certificate reserves. In effect, the rise in foreign deposits at the Federal Reserve offsets the expansionary effect of the Treasury gold purchase. Ordinarily, however, foreign central banks keep their deposits at the Federal Reserve to relatively low levels, partly because they yield no return. Thus, there is likelihood of Step 2, in which the Bank of France transfers the funds to Americans. This can happen in several ways. For example, the Bank of France may sell checks on its deposits at the Federal Reserve to Frenchmen who wish to make payments to Americans. Or it may on its own account buy Treasury bills or other investments in the American markets. In any case, the recipient of the check is likely to send it to his bank to be added to his deposit account, his bank will send it to the Federal Reserve, and the Federal Reserve will deduct $100 million from the deposit account of the foreign central bank and add $100 million to deposits due to the commercial bank. Thus, the direct effects of Treasury net purchases of gold from foreign central banks are normally to increase by equal amounts the public's money supply, the volume of commercial-bank reserves, and gold-certificate holdings by the Federal Reserve.

The direct effects of Treasury net sales of gold to foreign central banks or international institutions are normally the reverse of those described above. Suppose that the Bank of England uses checks drawn on American banks to buy $50 million of gold from the Treasury. The latter will send the checks to the Federal Reserve with instructions to retire an equal amount of gold certificates; the Federal Reserve will subtract $50 million from its deposit liabilities to the banks on which the checks were drawn and send the checks to the banks; and the banks will deduct $50 million from the deposits of their customers. Thus, the direct effects of the Treasury's net sales of gold are to reduce by $50 million the public's money supply, commercial-bank reserves, and Federal Reserve holdings of gold certificates.

As shown in Table 9–2, the size of the nation's monetary gold stock has varied over a wide range, thereby tending to have large direct effects on the volume of bank reserves and the nation's money supply. Because of the magnitude and importance of these Treasury transactions, several points must be emphasized:

1. Net purchases or sales of gold by the Treasury serve to increase or decrease by equal amounts the public's money supply, bank reserves, and

Federal Reserve holdings of gold certificates. Note that these are only the direct effects; the induced effects flowing from changes in the volume of bank reserves may be much larger.

TABLE 9–2. Monetary Gold Stock of the United States on Selected Dates (In millions of dollars)

Date	Monetary Gold Stock	Change from Preceding Date
August, 1917	$ 2,896	$ ——
November, 1924	4,230	+ 1,334
January, 1934	4,036	− 194
November, 1941	22,786	+18,750
December, 1945	20,065	− 2,721
October, 1949	24,584	+ 4,519
June, 1963	15,797	− 8,787

SOURCE: Various Federal Reserve publications.

2. Because the Treasury is a willing buyer of gold at a fixed price and a willing seller at a fixed price for legal purposes, it has no direct control over the volume of its gold holdings, and the Federal Reserve has no direct control over its holdings of gold certificates. In various indirect ways, however, the Federal Reserve and the Treasury can influence the amounts of gold offered or demanded.

3. As we shall see later, gold purchases and sales also affect the behavior of the exchange rate on the dollar.

Foreign-Exchange Holdings

Before the early 1960s the Federal Reserve and the Treasury held the exchange rate on the dollar within narrow limits only by purchasing and selling gold. They supplied dollars to other countries by purchasing gold, and they removed excess dollars from the exchange market by selling gold for dollars. Beginning in the early 1960s, however, they began to buy and sell foreign exchange for this purpose. By foreign exchange we mean claims denominated in foreign currencies. These include such things as deposit claims against foreign banks, short-term claims against foreign governments, and short-term claims against foreign private debtors. The Federal Reserve and the Treasury can supply dollars in exchange markets by purchasing foreign exchange, thereby tending to hold down the exchange rate on the dollar. And they can remove excess dollars from exchange markets by selling foreign exchange, thereby tending to support the exchange rate on the dollar. We shall see later that this can be an important device for influencing not only the dollar ex-

change rate but also the amounts of gold offered to, or demanded from, the Treasury.

At this point, however, we are concerned only with effects on domestic monetary and credit conditions when the Federal Reserve makes net purchases or sales of foreign exchange. These are almost exactly the same as those resulting from net purchases or sales of gold.[2] When the Federal Reserve buys foreign exchange, it pays with checks on itself, and these are added to the money supply of the seller and to bank reserves. And when it sells foreign exchange, it withdraws funds from both the money supply and bank reserves.

Discounts and Advances

As noted earlier, the Federal Reserve has no direct control over the volume of its assets in the form of gold certificates, and thus cannot manage these holdings in such a way as to regulate the volume of bank reserves. Moreover, Federal Reserve purchases and sales of foreign exchange are usually undertaken primarily to influence the exchange rate on the dollar rather than to manage the volume of bank reserves. We come now to three types of assets that the Federal Reserve can buy and sell at will and whose volume can be increased and decreased to regulate the supply and cost of bank reserves. These are discounts and advances, acceptances, and United States government securities. All these Federal Reserve assets are debt claims against others. Discounts and advances are simply outstanding Federal Reserve loans to borrowers, mostly member banks. Most of the Federal Reserve holdings of acceptances and government securities are purchased in the open market.

Both the theory and form of Federal Reserve credit have changed markedly since the inception of the Federal Reserve System. The framers of the Federal Reserve Act seem to have assumed that the new Reserve banks would be guided by two principles in extending their credit:

1. They would provide credit largely, if not exclusively, by lending to member banks. They would act as "bankers' banks," lending to their members much as commercial banks lend to their own customers. They might occasionally buy or sell securities in the open market, but these operations would be limited and of minor importance.

2. They would extend their credit largely on the basis of private debt obligations. In lending to members, they would either discount paper

[2] Treasury purchases and sales of foreign exchange usually do not have these domestic effects because the Treasury uses dollars acquired through taxation or borrowing. The effects may be the same, however, if the Treasury pays for foreign exchange by decreasing its deposits at the Federal Reserve and if it uses the proceeds from sales of foreign exchange to increase its deposits at the Federal Reserve.

acquired by banks in lending to their own customers or would make advances to banks on the basis of collateral consisting of these private debt obligations. They were to provide credit to only a limited extent, if at all, on the basis of the debt of the federal government.

All of this is now reversed. The Reserve banks still lend to member banks, but most of their funds are provided by purchasing securities in the open market. Moreover, most of their credit is based not on private debt but on the debt of the federal government. The debts that they buy and sell in the open market are largely federal debt obligations, and even their loans to member banks are largely collateralized by Treasury obligations. Of the many factors accounting for this reversal, two should be emphasized:

1. *Changes in the composition of outstanding debt.* Most of the debt outstanding just prior to World War I was private debt. The federal debt had shrunk to less than a billion dollars and nearly three-quarters of it was pledged at the Treasury as collateral for national bank notes. Banks had few free government securities that they could pledge as collateral for loans, and the volume of "floating" government securities in the market was far too small to permit large Federal Reserve purchases and sales even if the System had wished to make them. Two world wars and a great depression changed all this. By the end of World War I, the federal debt had grown to $26 billion. After falling about $9 billion during the 1920s, it grew to more than $55 billion during the great depression. After the end of World War II, federal debt outside the Treasury amounted to more than $200 billion and was widely held by banks and almost all other types of investors. As banks increased their holdings of federal securities, they tended to pledge them as collateral for loans from the Federal Reserve. Even in the 1920s, more than half of all member bank borrowings at the Reserve Banks were collateraled by Treasury obligations; since the mid-1930s almost all their borrowings have been of this type. Moreover, the very large growth of the federal debt and its wide ownership have made possible large Federal Reserve open-market operations in these securities.

2. *Changes in concepts of Federal Reserve responsibilities.* The original theory of the Federal Reserve was one of "passive accommodation." The theory was that the Reserve banks should "accommodate commerce, industry, and agriculture" by assuring that their "legitimate" needs for credit were met. As long as this theory prevailed, it was plausible (if not valid) to argue that the volume of Federal Reserve credit should be made passively responsive to the member banks' demands for loans, for these demands would faithfully reflect increases and decreases in the economy's

"needs" for credit. Gradually, however, it became apparent that such a policy of passive accommodation could seriously destabilize the economy. A policy of passively supplying rising demands for credit during periods of high prosperity could "boom the boom," and a policy of passively accepting repayment of outstanding Federal Reserve loans in periods of declining business activity could "depress the depression." The Federal Reserve therefore shifted from a philosophy of passive accommodation to one of positive control. The new policy called for resistance to undesirable changes in the supply of money and credit and for efforts to achieve selected objectives. This shift of philosophy encouraged a substitution of Federal Reserve open-market operations for Federal Reserve lending, for by undertaking open-market operations on its own initiative, the Federal Reserve could control more accurately the volume of bank reserves. It no longer had to depend on member banks to take the initiative in increasing or decreasing their demands for Federal Reserve credit.

Though by far the largest part of its loans is to member banks, the Federal Reserve sometimes makes small direct loans to the Treasury, nonmember banks, foreign central banks, and business. Congress so fears that the Treasury might abuse its power to borrow directly from the Reserve banks that it extends the enabling legislation only one year at a time and provides that at no time shall the Reserve banks hold more than $5 billion of securities acquired directly from the Treasury. Only rarely does the Treasury borrow directly from the Federal Reserve. Federal Reserve loans to nonmember banks are largely limited to periods of war and national crisis. It is felt that, in more normal times, these banks should not have the privilege of borrowing if they will not assume the obligations involved in becoming members of the Federal Reserve. Loans to foreign central banks are usually small, but extremely useful when these banks need additional gold and foreign exchange reserves. The Reserve banks never lent directly to business firms until the mid-1930s. However, complaints that worthy borrowers were unable to secure credit led to an amendment to the Federal Reserve Act providing that Reserve banks might lend directly to a business firm if that firm could prove both that it was creditworthy and that it could not secure credit from its normal sources at reasonable rates. Federal Reserve loans of this type were never large even during the Great Depression. This power of the Reserve banks to lend to business was repealed by Congress in 1958.

Though the distinction has little economic significance, Federal Reserve loans to member banks are of two principal types: discounts (sometimes called *rediscounts*) and advances. When a bank secures Federal

Reserve credit by discounting, or rediscounting, it simply endorses some of its customers' paper and sends it to a Reserve bank for "discount." In effect, the Federal Reserve subtracts interest at its prevailing discount rate and credits the remainder to the borrowing bank's reserve account. Advances are simply loans to a bank on its own promissory note, though some sort of acceptable collateral is required. In recent years, most Federal Reserve loans have been in the form of advances.

What types of paper should be eligible for discount or as collateral for Federal Reserve advances to member banks? This was long a controversial subject. The original Federal Reserve Act was based on the theory that the Reserve banks should take only "short-term self-liquidating agricultural, industrial, or commercial paper which was originally created for the purpose of providing funds for producing, purchasing, carrying or marketing of goods." They should not take paper whose proceeds were "used to finance fixed investments of any kind; or any investments of a purely speculative character; or for carrying or trading in stocks and bonds except obligations of the United States; or to finance relending operations except relending by cooperative marketing associations and factors." The theory that this short-term, self-liquidating paper should be given preferential status still survives in the provision that the Reserve banks may discount (or rediscount) only paper of this type. But this provision is now of only limited importance, for most Reserve bank loans take the form of advances, and other types of bank assets may be used as collateral for these advances.

The so-called "commercial loan theory of banking," on which the lending provisions of the original Federal Reserve Act were based, has lost most of its adherents since 1914 and has virtually ceased to serve as a guide to Reserve-bank lending. There are several reasons for this:

1. *The mechanical difficulties of discounting customers' paper or of using it as collateral for advances to commercial banks.* Reserve-bank advances to banks with government securities as collateral are much simpler.

2. *Inadequacy of member bank holdings of eligible commercial paper.* Because of changes in the business structure and in commercial bank lending practices after World War I, bank holdings of high-quality commercial paper declined markedly. The decline was especially great during the depression following 1929. As a result, it was necessary to make other types of bank assets eligible as a basis for borrowing if the Reserve banks were to be of maximum usefulness to their members and to the economy.

3. *The basic fallaciousness of the commercial loan theory.* With the passage of time, it became increasingly evident that the restriction of

commercial-bank and Reserve-bank loans to "commercial paper" could not attain any of the objectives claimed for it. It could not automatically adjust the volume of credit to the amount that is socially desirable, for harmful inflations and deflations of the volume of credit can occur even if both commercial banks and Reserve banks make only "commercial loans." Moreover, it has become increasingly clear that "commercial paper" is often less liquid than some other types of assets, especially call loans on securities and short-term government obligations. An individual commercial bank can achieve "liquidity" more easily by selling highly marketable securities than by calling its commercial loans. The "liquidity" of any asset for the commercial-banking system as a whole depends on the ability and willingness of the Reserve banks to buy it or lend on it and to issue currency or bank reserves in exchange. Thus, the liquidity of the commercial-banking system as a whole is enhanced by broadening the Reserve banks' lending powers, not by limiting the types of paper on which they can lend. It is hard to see how any asset can be "illiquid" for the Reserve banks if it can be used as a basis for issuing Federal Reserve notes, which have full legal-tender powers.[8]

Because of the factors indicated above, the types of assets on which the Reserve banks may lend have been greatly broadened. The present powers of the Federal Reserve to lend to member banks may be summarized as follows:

1. The Reserve banks may discount (or rediscount) for member banks only short-term commercial paper of the type described above. Only infrequently, however, do banks borrow in this way.

2. By far the greater part of Reserve-bank loans take the form of advances to banks, with collateral in the form of eligible short-term commercial paper or United States government securities. Most of these advances have government securities rather than commercial paper as collateral.

3. Though virtually all Reserve-bank loans to banks take the above forms, the Banking Act of 1935 provides that a Reserve bank can also make advances to a member bank on its note "secured to the satisfaction of the Federal Reserve bank" and complying with rules and regulations prescribed by the Board of Governors. The effect of this provision is to give the Federal Reserve System almost complete freedom to determine the types of collateral it will accept. But loans made under this provision must bear interest at a rate not less than ½ of 1 percent above the highest rate applicable to loans of the types under (1) and (2) above. As a

[8] For a good short criticism of the commercial loan theory as applied to Reserve banks, see W. R. Burgess, *The Reserve Banks and the Money Market*, New York, Harper & Row, 1936, pp. 41–67.

result, banks usually do not borrow under this section as long as they have an adequate supply of eligible commercial paper and government obligations.

In short, the trend has been toward greater freedom for the Federal Reserve to determine the types of loans it will make. It is difficult to see why this trend should not be extended by eliminating from the Federal Reserve Act all its complex eligibility requirements and stating simply that the Federal Reserve may lend to member banks on any assets it deems acceptable. This would not only enable the Reserve banks to be of maximum help in time of strain, but would also end forever the implication that there is any necessary relationship between the type of paper offered to the Reserve banks for discount or as collateral and the type of use to which the borrowed funds will be put.

It should be clear that the Federal Reserve can create or destroy bank reserves by increasing or decreasing its outstanding loans, whether these are called discounts or advances, regardless of the nature of the collateral used.

Case I indicates that when the Federal Reserve expands its loans to

	FEDERAL RESERVE BANKS		COMMERCIAL BANKS	
	A	L	A	L
Case I	loans + \$100	deposits due banks + \$100	reserves + \$100	borrowings from the Federal Reserve + \$100
Case II	loans − \$50	deposits due banks − \$50	reserves − \$50	borrowings from the Federal Reserve − \$50

banks, it creates for them an equal increase in their reserves. Case II shows that when the Federal Reserve decreases its outstanding loans, it collects by reducing bank reserves.

Acceptances

Acceptances were not widely used in the United States before the passage of the original Federal Reserve Act. National banks were not permitted to accept time drafts drawn on them for the benefit of their customers, and there was no well developed acceptance market. Critics found many faults with this situation. They complained that banks were deprived of legitimate business, that America's growth as an international financial center was inhibited, that industry was deprived of a convenient and cheap method of short-term finance, and that temporarily available

short-term funds tended to be diverted into security speculation rather than channeled into the financing of commerce and industry. To remedy this situation, the Federal Reserve Act empowered national banks to accept drafts drawn on them, thereby promoting a supply of acceptances, and provided that the Reserve banks might purchase acceptances in the open market, thereby helping create a market for them.

The importance of Federal Reserve open-market operations in acceptances has varied widely. During the period prior to the Great Depression, Federal Reserve holdings of this paper were often large, sometimes larger than its holdings of governments. The volume of outstanding acceptances declined sharply during the Great Depression and remained very low until after the end of World War II. Federal Reserve operations in acceptances were negligible during this period. More recently, however, the volume of acceptances has again begun to grow and the Federal Reserve has resumed its purchases and sales of them. These operations are still very small, but they could grow in the future.

Net Federal Reserve purchases and sales of acceptances have the same effects on bank reserves and the money supply as do similar transactions in government securities. These will be discussed in the next section.

United States Government Obligations

By far the largest volume of Federal Reserve assets is in the form of debt claims against the United States government. Table 9–1 shows that in mid-1963 these amounted to nearly $32 billion, or more than 60 percent of total Federal Reserve assets. This asset is of special importance not only because it is so large but also because it has become the principal medium through which the Federal Reserve regulates the volume and cost of bank reserves. The Federal Reserve creates bank reserves by purchasing government securities, and it destroys bank reserves by selling government securities. It buys and sells very frequently, sometimes almost continuously, and its net purchases or sales are often very large.

As already indicated, Federal Reserve purchases and sales of acceptances, foreign exchange, and government securities are under the jurisdiction of the Federal Open-Market Committee and are executed for the System account through the Federal Reserve Bank of New York. The manager of the account buys and sells through government security dealers, of which there are less than 20. These, in turn, deal with every type of investor that buys and sells government securities—commercial banks, all other types of financial institutions, nonfinancial business firms, individuals, foreign central banks, and others. The manager of the open-market account usually does not know the ultimate source of the secu-

rities he buys or the ultimate buyers of the securities he sells. It will further our analysis, however, to distinguish two types of transactions: (1) Federal Reserve purchases from, and sales to, commercial banks; and (2) Federal Reserve purchases from, and sales to, nonbank investors.

Consider first the case in which the Federal Reserve purchases $500 million of government securities from commercial banks. As shown in Case I, the effect is to increase bank reserves by $500 million. The Federal Reserve pays for its additional assets by creating additional deposit liabilities to the selling banks. The total assets of commercial banks are not

	FEDERAL RESERVE		COMMERCIAL BANKS	
	A	L	A	L
Case I	government securities + $500 million	deposits due banks + $500 million	reserves + $500 million government securities − $500 million	
Case II	government securities − $700 million	deposits due banks − $700 million	reserves − $700 million government securities + 700 million	

directly changed; the banks have simply exchanged $500 million of earning assets for an equal amount of legal reserves. The public's money supply is not directly affected. However, with the addition of $500 million to the excess reserves of banks, an expansion of bank credit and deposits becomes likely. Case II shows that a Federal Reserve sale of $700 million of government securities to banks will decrease bank reserves by that amount. In effect, the Federal Reserve collects from the buying banks by subtracting from their reserve accounts. There is no direct effect on the public's money supply, but a reduction may be induced by the decrease in bank reserves.

Let us now consider the case of Federal Reserve purchases of securities from any ultimate seller other than a bank. Case III assumes that you, as an insurance company executive, a manufacturer, or an individual, sell $500 million of government securities to the Federal Reserve. As shown in the balance sheets, the direct effect is to increase by $500 million both the public's money supply and bank reserves. When you, as the seller of securities, receive the $500 million check, you deposit it in your bank, which adds its amount to your deposit account and then sends it to the Federal Reserve, which adds it to the bank's reserve account.

A comparison of Cases I and III shows that all Federal Reserve purchases of securities add to the volume of bank reserves, but that only purchases from nonbank sellers add directly to the public's money supply.

	FEDERAL RESERVE		COMMERCIAL BANKS		PUBLIC	
	A	L	A	L	A	L
Case III	government securities + $500 million	deposits due banks + $500 million	reserves + $500 million	deposits + $500 million	deposits + $500 million government securities − $500 million	
Case IV	government securities − $700 million	deposits due banks − $700 million	reserves − $700 million	deposits − $700 million	deposits − $500 million government securities + $700 million	

The total effects on the public's money supply and on the supply of credit may be the same in the two cases when both the direct effects and the induced expansion of commercial-bank loans and security holdings are taken into account. In Case I, where the banks receive increased reserves without any increase in primary deposits, the entire $500 million is added to excess bank reserves and becomes the basis for creating new derivative deposits through an expansion of commercial-bank loans and security holdings. In Case III, however, the banks receive the $500 million of reserves in a transaction that increases their primary deposits. Some part of the increase of reserves must therefore be used to meet reserve requirements against the primary deposits, and only the remainder becomes excess reserves that can serve as a basis for creating derivative deposits.

Separation of Cases I and III nevertheless serves to emphasize some important points. (1) The Federal Reserve can buy securities even when commercial banks do not want to sell; it can buy them from nonbank sellers who are depositors at banks. (2) The Federal Reserve can itself directly increase the public's money supply and need not rely solely on the willingness of banks to expand their loans and security holdings. Quantitatively, this direct effect of Federal Reserve purchases is usually much smaller than the expansion of commercial bank credit induced by the increase in their reserves. At times, however, it is important. (3) The Federal Reserve can directly contribute to the supply of lendable and spendable funds. Nonbank financial institutions, business firms, and others who sell securities to the Federal Reserve are provided with funds

that they can lend, spend, or use otherwise as they wish. We shall emphasize the effects of Federal Reserve purchases and sales on the volume of commercial-bank reserves, and thus on the ability of the banks to create credit and money, because these are usually so much larger. But the other effects should not be forgotten.

The effects of Federal Reserve sales of securities to purchasers other than commercial banks are exactly the reverse of those in Case III. As shown in Case IV, Federal Reserve sales of $700 million of securities to you, a nonbanker, would reduce by that amount both the public's money supply and commercial bank reserves. When the Federal Reserve received your check, it would deduct it from the reserve balance of your bank and send it to your bank, which can be relied upon to deduct it from your deposit account. You and other nonbank purchasers of securities from the Federal Reserve would have less funds to lend to others, to spend, or to use otherwise.

Later sections will discuss at length the policy problems faced by the Federal Reserve as it must decide when, to what extent, and on what terms it will purchase or sell acceptances and government securities in the open market.

Federal Reserve "Float"

Only one other Federal Reserve asset requires consideration here. This is Federal Reserve "float." This is actually a net asset item arrived at by subtracting a liability called *deferred availability cash items* from an asset called *uncollected cash items.* Both arise out of the Federal Reserve function of clearing and collecting checks and other such claims. Checks worth billions of dollars flow into the Federal Reserve banks every day and require some time to be cleared, paid to the reserve accounts of the banks that deposited them, and deducted from the reserve accounts of the banks on which they are drawn. As a result, at any point of time, the Federal Reserve owns a great volume of checks that it has not yet collected and which it has not yet paid. The asset "uncollected cash items" indicates the value of checks in its possession on which it has not yet collected by deducting from its deposit liabilities to banks. The liability "deferred availability cash items" indicates the value of checks it has not yet paid by adding to its deposit liabilities to the banks that sent the checks to it.

If the Federal Reserve paying and collection schedule were to work out perfectly, these asset and liability items would balance out exactly, for the Federal Reserve attempts to pay banks depositing checks at the

same time that it collects from the banks on which the checks are drawn. As checks flow into the Reserve banks, they are classified as payable "today," "tomorrow," or "the day after tomorrow," the date depending on the estimated time required for the checks to reach the banks on which they are drawn. On the appointed day, the amounts of the checks are credited to the reserve accounts of the depositing banks. Ideally, they would on the same day be deducted from the reserve accounts of the banks on which they are drawn. In this case "deferred availability cash items" would be exactly equal to "uncollected cash items"; the Federal Reserve would not have paid depositing banks before it collected from others. In the process of clearing and collection, it would have neither created nor destroyed bank reserves but would have only shifted reserves from some banks to others.

In practice, however, the Federal Reserve sometimes pays depositing banks before it collects from the banks on which checks are drawn. To this extent, it contributes to total bank reserves. This source of bank reserves is called *Federal Reserve float.* At any point of time, it measures the net amount the Federal Reserve has contributed to bank reserves because it has paid some banks before it collected from others. For example, on the date to which Table 9–1 refers, Federal Reserve float amounted to $1258 million. In most of the Federal Reserve balance sheets that we shall use later, we shall enter float as a net asset item and omit the two items from which it has been derived.

Several factors account for the existence of Federal Reserve float:

1. *Unrealistic collection schedules.* In at least a few cases, checks could not within the appointed time reach the banks on which they are drawn even if their flow were unimpeded. For example, checks drawn on banks located in remote sections of Utah and Nevada and deposited at the Federal Reserve Bank of Boston are credited two days later to the reserve accounts of the banks that deposited them, even though the checks cannot within that time reach the bank on which they are drawn.

2. *Delays in the transit departments of the Federal Reserve banks.* The time of paying a check is determined at the time of its receipt at a Federal Reserve bank. If the process of clearing is delayed because of inadequate staff, or an unusually heavy flow of work, or for any other reason, the collection of checks may be delayed.

3. *Delays in transportation.* Anything that delays the transportation of checks after they have been received by a Reserve bank and their dates of payment have been determined can increase float. For example, a heavy fog over the eastern half of the United States could delay the air mail and

the collection of checks from the banks on which they are drawn and increase Federal Reserve float and bank reserves by several hundred million dollars.

Once the Federal Reserve has determined its time schedules for clearing and collection, it has no direct control over the volume of float. It must passively pay and collect checks in accordance with its announced schedules. Unfortunately, Federal Reserve float fluctuates widely over short periods. Sometimes it rises by several hundred million dollars, owing to such things as delays or large increases in the value of checks in transit. This, of course, tends to increase bank reserves and to ease credit conditions. Float falls by several hundred millions at other times, owing to such things as a reduction in the value of checks in transit or a reduction in the backlog of uncollected checks. This tends to reduce bank reserves and to tighten credit conditions. We shall see later that one function of the Federal Reserve is to prevent fluctuations in the volume of float, and in other things capable of altering the reserve positions of the banks, from exerting unwanted influences on monetary and credit conditions.

LIMITATIONS ON FEDERAL RESERVE LIABILITIES AND ASSETS

What, if anything, limits the extent to which the Federal Reserve can create Federal Reserve note and deposit liabilities by purchasing assets of various kinds? One limit is provided by the legal reserve requirements of these banks. The Federal Reserve Act requires the Reserve banks to maintain gold-certificate reserves equal to at least 25 percent of their outstanding Federal Reserve note and deposit liabilities. This is just another way of saying that the sum of outstanding Federal Reserve notes and deposits shall not be more than four times the gold certificate reserves held by the Reserve banks. In an indirect way, this reserve requirement also sets an upper limit on Federal Reserve acquisitions of loans and securities, for these lending and investing operations create Federal Reserve note or deposit liabilities.

It would, however, be a mistake to assume either that these reserve requirements set an inflexible upper limit to the volume of Federal Reserve liabilities or that they are often the operative limitation. In the first place, the Board of Governors is empowered to suspend the reserve requirements of the Reserve banks for a period not exceeding 30 days and to renew the suspension an indefinite number of times, each renewal not to exceed 15 days. The only legal penalty is a graduated, but not prohibitive, tax on the amount of a Reserve bank's reserve deficiency and a requirement that the Reserve banks raise the interest rates on their loans

by the amount of the tax. The Board would be reluctant to use this power, but it remains available. In the second place, Congress can lower these reserve requirements and might do so if existing requirements threatened to limit the ability of the Federal Reserve to achieve ends that Congress believed to be desirable. This has already occurred once. Prior to 1945, the Federal Reserve Act required the Reserve banks to hold reserves equal to at least 35 percent of their deposit liabilities and 40 percent of their outstanding Federal Reserve notes. By the middle of 1945 the actual ratio of reserves to Federal Reserve note and deposit liabilities had fallen below 45 percent, and it was feared that the Reserve banks would soon have to choose between suspending their reserve requirements and ceasing to expand their loans and security holdings to facilitate war finance. Congress, wanting a continuance of easy-money policies, lowered the reserve requirements to 25 percent. That further reductions will occur in the future is by no means impossible.

TABLE 9–3. Ratios of Reserve Bank Reserves to Their Deposits and Outstanding Federal Reserve Notes

Year (Average for June)	Percentage of Reserves to Deposits and Outstanding Federal Reserve Notes	Year (Average for June)	Percentage of Reserves to Deposits and Outstanding Federal Reserve Notes
1917	70.9	1939	85.4
1918	57.4	1940	88.5
1919	50.6	1941	91.1
1920	41.3	1942	89.3
1921	65.2	1943	73.8
1922	77.8	1944	56.3
1923	76.7	1945	44.9
1924	82.5	1946	42.7
1925	76.3	1947	47.7
1926	75.4	1948	51.2
1927	77.8	1949	54.2
1928	68.0	1950	56.3
1929	74.5	1951	46.6
1930	82.4	1952	48.1
1931	84.3	1953	45.6
1932	58.4	1954	45.5
1933	68.3	1955	46.1
1934	69.5	1956	45.9
1935	73.8	1957	47.2
1936	78.8	1958	45.3
1937	79.6	1963	32.1
1938	82.5		

SOURCE: *Federal Reserve Bulletins.*

Most important, however, is that fact that on only a few occasions have the Federal Reserve banks expanded their credit and liabilities close to the limits permitted by their legal reserves. We found earlier that profit-motivated commercial banks do tend to expand their loans and security holdings to the maximum permitted by their reserves unless they are deterred by fear of risk. But the primary purpose of the Federal Reserve is not to make profits; it is to regulate the supply of money and credit in the public interest, which often requires a sacrifice of potential profits. The actual reserve ratios of the Reserve banks have approached the legal minimum on only three occasions: in 1920, 1931, and 1945. However, concern about the adequacy of the nation's gold reserves again began to affect Federal Reserve policies in the early 1960s as the nation's monetary gold stock declined and its short-term debts to foreign central banks and others rose. This occurred even while the Federal Reserve's actual reserve ratio was still above the legal minimum.

Most students of monetary management now believe that, for several reasons, all legal reserve requirements for the Reserve banks should be repealed because (1) these requirements are usually inoperative, and if they do become operative, it is likely to be in a period of stress or crisis when their restrictive effects are undesirable; (2) discretionary management is likely to yield more beneficial monetary results than will such mechanical guides as legal reserve requirements; and (3) outright repeal of these legal requirements would assure the world that the nation's entire monetary gold stock is available to support the dollar in exchange markets and that none of it is to be withheld from this purpose in time of need.

DETERMINANTS OF MEMBER-BANK RESERVES

While pointing out that the Federal Reserve can create or destroy member bank reserves by purchasing or selling assets of any sort, we stressed the fact that it has direct control over only two types of its asset holdings: its loans in the form of discounts and advances and its holding of acceptances and United States government securities acquired in the open market. It can buy or sell these assets at its discretion. It has no direct control over the volume of its holdings of other assets, notably gold certificates and float, though these affect the volume of member-bank reserves. There are also several other factors that have important effects on the volume of member-bank reserves and over which the Federal Reserve has no direct control. To understand fully either the operation of the monetary and banking system or several aspects of

Federal Reserve policy, one must have a thorough understanding of all these major determinants of the volume of member-bank reserves.

To aid our understanding and to facilitate its own operations, the Federal Reserve has developed an excellent statistical series entitled, "Member Bank Reserves and Related Items." These statistics, which are issued weekly by the Board of Governors, are carried in the major Thursday afternoon and Friday morning newspapers, in the monthly *Federal Reserve Bulletin*, and in several other periodicals. Table 9–4

TABLE 9–4. Member-Bank Reserves and Related Items for the Week Ending June 12, 1963
(figures are in millions of dollars and are a weekly average of daily figures)

Sources		*Uses*	
Federal Reserve credit:		Currency in circulation	$35,298
U.S. government securities	$31,587	Treasury cash holdings	402
Acceptances	43		
Discounts and advances	249	Deposits at Federal Reserve due to:	
Float	1,382	Treasury	774
Total Federal Reserve Credit	$33,261	Foreign	218
		Other	205
Gold stock	15,797	Member banks	16,587
Treasury currency outstanding	5,581	Other Federal Reserve accounts (net)	1,156
Total sources	$54,639	Total uses	$54,639

Addendum: Member-bank reserves		
Member-bank deposits at the Federal Reserve	=	$16,587
Plus: Cash in vault	=	2,822
Total member-bank reserves		$19,409
Less: Required reserves		19,013
Equals: Excess reserves		$ 396

presents such a statement for the week ending June 12, 1963.[4] All these items are derived from the balance sheets of the United States Treasury and the Federal Reserve banks. The column on the left, labeled "Sources," includes all the sources of funds that are capable of being used as member-bank reserves. If there were no competing uses for these funds, the volume of member-bank reserves at any time would be equal to the sum of these sources. We have already discussed the first principal source, total Federal Reserve credit. This is simply the volume of funds that has been created by the Federal Reserve in the process of acquiring and holding assets in the form of United States government securities, acceptances, discounts and advances, and float. This source accounted for

[4] For back figures and an excellent description of this series and of the method of deriving it, see Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics*, Washington, D.C., 1943, pp. 360 ff., or *Federal Reserve Bulletin*, July, 1935.

more than half of all these funds. The second major source is the monetary gold stock of the United States, sometimes referred to simply as "the gold stock." This is the volume of funds that has been supplied as the Treasury bought and held gold. The third source, Treasury currency, indicates the amount of funds supplied by the volume of outstanding coin and paper money issued by the Treasury.

The right-hand column of Table 9–4, labeled "Uses," shows the various uses to which are put the total funds provided by the sources and the amounts absorbed in each use. It is immediately apparent that large amounts of the funds supplied by the sources are not available for use as member bank reserves because they are absorbed by competing uses. The volume of member-bank reserves at any time is equal to the total volume of funds supplied by the sources in the left column minus the amounts of these funds absorbed in other uses, shown in the column on the right. This can be put in the form of an equation:

$$\left.\begin{array}{l}\text{Member-bank}\\ \text{reserve}\\ \text{balances}\\ \text{at any}\\ \text{time}\end{array}\right\} = \left\{\begin{array}{c}\textsc{Sources}\\ \text{Total Reserve bank}\\ \text{credit outstanding}\\ +\\ \text{Monetary gold stock}\\ +\\ \text{Treasury currency}\end{array}\right\} - \left\{\begin{array}{l}\textsc{Competing Uses}\\ \text{Currency in circulation}\\ \text{outside member banks}\\ \qquad +\\ \text{Treasury cash holdings}\\ \qquad +\\ \text{Treasury deposits at the}\\ \text{Reserve banks}\\ \qquad +\\ \text{Nonmember deposits and}\\ \text{other Federal Reserve}\\ \text{accounts}\end{array}\right.$$

For example, Table 9–5 shows an average of $19,409 million of member-bank reserves for the week ending June 12, 1963. These were equal to the $54,639 million supplied by the various sources at that time, minus the net amounts absorbed by competing uses.

The preceding discussion related to the factors that determine the size of member bank reserves as of a *given date*. Changes in these factors over any stated period of time determine the *change* in the volume of member-bank reserves during that period. Increases or decreases in the source items tend to increase or decrease member-bank reserves. On the other hand, increases in the amounts of funds absorbed in competing uses tend to reduce bank reserves, and decreases in the amounts of funds employed in competing uses tend to increase bank reserves. This is illustrated in Table 9–5, which compares member-bank reserves and related items during the week ending June 12, 1963, with those during the week ending May 21, 1958. Member-bank reserves increased $1,161 million during this

period. Factors that tended to decrease member-bank reserves during this period were the decrease in the gold stock and increases in competing use items in the form of currency in circulation, Treasury deposits at the Federal Reserve, and other Federal Reserve accounts, net. The latter

TABLE 9–5. Member-Bank Reserves and Related Items, Week Ending May 21, 1958, and Week Ending June 12, 1963

(weekly averages of daily figures amounts in millions of dollars)

Reserves and Related Items	May 21, 1958	June 12, 1963	Changes in Items During the Period: Tending to Increase Bank Reserves	Changes in Items During the Period: Tending to Decrease Bank Reserves
SOURCES				
Federal Reserve credit:				
U.S. govt. securities	$23,876	$31,587	+ 7,711	
Acceptances	41	43	+ 2	
Discounts and advances	104	249	+ 145	
Float	994	1,382	+ 388	
Total Federal Reserve credit	$25,016	$33,261		
Gold stock	21,779	15,797		− 5,982
Treasury currency Outstanding	5,200	5,581	+ 381	
Total sources	$51,995	$54,639		
Minus: COMPETING USES				
Currency in circulation	30,822	35,298		+ 4,476
Treasury cash holdings	732	402	− 330	
Treasury deposits at Federal Reserve	459	774		+ 315
Foreign deposits at Federal Reserve	309	218	− 91	
Other deposits at Federal Reserve	381	205	− 176	
Other Federal Reserve accounts (net)	1,043	1,156		+ 113
Total competing uses	$33,747	$38,052		
Equals: MEMBER-BANK DEPOSITS AT FEDERAL RESERVE	18,248	16,587		
Plus: RESERVES IN FORM OF MEMBER-BANK CASH IN VAULT	—	2,822	+ 2,822	
Equals: MEMBER-BANK RESERVES	$18,248	$19,409		
Total changes tending to increase reserves			12,046	
Total changes tending to decrease reserves				10,886
Net change in reserves			+ 1,161	

SOURCE: *Federal Reserve Bulletin*, various issues.

reflects principally Federal Reserve capital accounts. On the other hand, member-bank reserves tended to be increased by increases in all forms of Federal Reserve credit and in the quantity of Treasury currency outstanding and by funds released by decreases in competing uses. During this period the volume of legal reserves also tended to be increased by the 1959 legislation, which enabled the Federal Reserve to permit member banks to count cash in vault as legal reserves.

COMPETING USES

No further description of the various sources should be necessary here; a review of earlier sections should clarify the processes through which increases or decreases in these items tend to increase or decrease the volume of bank reserves. However, some of the items under "competing uses" in the preceding equation require comment.

Currency in Circulation

Of all the competing uses of funds supplied by the sources, currency in circulation outside member banks is by far the largest. It also shows the largest increases and decreases. As noted earlier, when the public wishes to hold more coin and paper money, it withdraws these forms of money from the banks, which thereby lose reserves in the form of cash in vault or deposits at the Federal Reserve. On the other hand, when the public surrenders some of its holdings of coin and paper money to the banks, the latter receive an addition to their legal reserves. As indicated in Table 9–5, the official Federal Reserve tables handle this item in a somewhat clumsy way. They first include as a competing use all currency outside the Federal Reserve and the Treasury, including the cash held in member bank vaults. Then, at the end, they add back as a component of member-bank reserves, that amount of currency held by the member banks. At some time in the future the Federal Reserve may simplify this table by subtracting as a competing use only currency in circulation outside member banks.

Treasury Cash Holdings and Treasury Deposits at the Reserve Banks

Because they are so closely related and because their fluctuations have the same effects on the general monetary and credit situation, we shall consider together the Treasury cash holdings and Treasury deposits at the Federal Reserve banks. Both compete with member-bank reserves for funds supplied by the sources. Increases in both tend to decrease bank reserves, and decreases in both tend to add to bank reserves.

The Treasury can alter both the size of its money balance and the form in which it is held. It holds its money balance in three principal forms: (1) as cash in its own vaults, (2) as deposits at the Reserve banks, and (3) as deposits with commercial banks. As noted earlier, the last are usually called "tax and loan accounts." To illustrate the process through which increases in Treasury cash holdings or in Treasury deposits at the Federal Reserve tend to reduce member-bank reserves, let us consider two cases.

1. The Treasury deposits at the Federal Reserve $100 million of checks it has received from the public. These checks may represent payments of taxes or payments for securities bought by the public. On receiving the checks, the Federal Reserve will add $100 million to Treasury deposits and deduct the same amount from the reserve accounts of the banks on which they are drawn. The checks will then go to the banks on which they are drawn, which will deduct them from the public's deposit accounts. Thus, the effects are to decrease by $100 million both the public's money supply and member-bank reserves.

2. The Treasury increases its deposits at the Federal Reserve by withdrawing $100 million of deposits from commercial banks. On receiving the checks, the Federal Reserve will add them to Treasury deposits and subtract them from member-bank reserves.

In drawing down its cash in vault or its deposits at the Federal Reserve, the Treasury has the reverse effects:

1. Suppose the Treasury pays to the public $100 million of checks drawn on the Federal Reserve. The public will deposit the checks at commercial banks and the latter will send them to the Federal Reserve, which will deduct them from Treasury deposits and add them to member-bank reserve balances. Thus, the effects are to increase by $100 million both the public's money supply and member-bank reserves.

2. Suppose the Treasury pays out to commercial banks $100 million of checks drawn on the Federal Reserve banks. When the commercial banks return the checks to the Federal Reserve, the latter will deduct them from Treasury deposits and add them to bank reserves.

We shall see later that fluctuations in the size of Treasury holdings of cash and deposits at the Federal Reserve often tend to have important effects on the reserve positions of commercial banks, especially in periods of large net receipts or net payments by the Treasury, and the Federal Reserve often takes action to prevent their having undesired effects on the general credit situation. We shall also see that the Treasury itself may engage in monetary management by regulating the size and location of its cash and deposit holdings.

Foreign Deposits at the Federal Reserve

These are largely deposits owed by the Federal Reserve to foreign central banks. As do Treasury deposits at the Federal Reserve, they compete with member bank reserves for funds supplied by the sources. Increases in this item tend to decrease member-bank reserves, and decreases in it tend to add to member-bank reserves. Suppose, for example, that foreign central banks pay out to the United States public \$100 million of checks drawn on the Reserve banks. This will tend to increase by \$100 million both the public's money supply and member-bank reserves, for the public will deposit the checks at commercial banks, which will send them to the Federal Reserve to be added to their reserve accounts. If foreign central banks deposit at the Federal Reserve \$100 million of checks received from the United States public, the effects will be just the reverse: decreases in both the public's money supply and member-bank reserves.

Other Deposits at the Federal Reserve

These are largely deposits that nonmember banks maintain at the Federal Reserve to facilitate check clearing and collection. They are usually relatively small and fluctuate narrowly. Nevertheless, they are competitive with member-bank reserves for funds supplied by the sources. Increases in this item tend to reduce member-bank reserves, largely because they reflect net losses of reserves by member banks to nonmembers. On the other hand, decreases in this item, usually reflecting gains of reserves by members from nonmembers, tend to increase member-bank reserves.

Other Federal Reserve Accounts (Net)

This item is made up largely of the Federal Reserve net worth or capital account, with adjustments for minor asset and liability items not taken into account elsewhere. It competes with member-bank reserves for funds supplied by the sources. To the extent that the Federal Reserve acquires assets by issuing ownership claims, it does not have to issue liability claims. This item usually fluctuates only narrowly over short periods.

CONCLUSIONS

In carrying out its monetary policy, and especially its open-market operations in acceptances and government securities, the Federal Reserve relies heavily upon the type of analysis developed above. As Robert V

Roosa has pointed out, Federal Reserve open-market purchases and sales are of two principal types: dynamic and defensive. Dynamic purchases or sales are those undertaken to effect net increases or net decreases in member-bank reserves. Defensive purchases or sales are those undertaken to prevent other factors from bringing about unwanted changes in bank reserves. In effect, they are offsetting operations. These defensive operations can be in the right direction and in the right magnitude only to the extent that the Federal Reserve can forecast the behavior of the various determinants of member-bank reserves. The manager of the open-market account therefore seeks not only to detect changes as they occur but also to forecast future changes.

For this purpose, he has several sources of information. To help him forecast the behavior of Federal Reserve float, he has elaborate studies of its seasonal behavior in the past and reports from the various Reserve banks concerning any unusual conditions that might cause it to rise or fall. The behavior of float has proved difficult to forecast with accuracy. With respect to current and prospective changes in the monetary gold stock, he has several sources of information. The Reserve banks themselves, and especially the Federal Reserve Bank of New York, report purchases or sales of gold for Treasury account. The Treasury also reports its own transactions. Moreover, foreign central banks sometimes report several days in advance any plans they may have for buying or selling gold in the United States market. The Treasury reports any significant changes that it plans in the volume of its outstanding currency and in the size and location of its money balance. Studies of past seasonal patterns are used in predicting the volume of currency in circulation. Instructions from foreign central banks assist in forecasting the behavior of foreign deposits at the Federal Reserve. The Reserve banks also report changes in their deposit liabilities to nonmember banks and any large transactions that would affect significantly the size of other Federal Reserve accounts.

In short, an understanding of the nature and behavior of the various determinants of member-bank reserves is essential for both the student and the practitioner of monetary management.

Federal Reserve Bulletins.
Annual Reports.
Goldenweiser, E. A., *American Monetary Policy*, New York, McGraw-Hill, 1951.
Roosa, R. V., *Federal Reserve Operations in the Money and Government Securities Markets*, Federal Reserve Bank of New York, 1956.

10. Instruments of Monetary Management

This chapter will analyze the various instruments of monetary management in the hands of the Federal Reserve and a few under the control of the Treasury. "General" monetary or credit controls—those directed toward regulating the total supply of money or credit without necessarily regulating the allocation of credit among its various possible borrowers or uses—will be discussed first. Selective controls, those intended to regulate or influence the allocation of credit, will be considered later.

As already indicated, the Federal Reserve's powers to regulate the total volume of money and bank credit are of two broad types: (1) power to determine and alter member-bank reserve requirements, and (2) various powers to regulate the volume and cost of member-bank reserves. These will be discussed in order.

MEMBER-BANK RESERVE REQUIREMENTS

Prior to 1935, member-bank reserve requirements were rigidly set by the Federal Reserve Act and could not be altered by Federal Reserve officials. This legislation provided that nothing other than deposits at Reserve banks would count as legal reserves. Minimum reserve requirements against time and savings deposits were set at 3 percent for all member banks.[1] In fixing reserve requirements against demand deposits at member banks, the Federal Reserve Act carried over the classifications used in the National Banking Act. Central Reserve city banks are those

[1] This discussion relates to the legislation in effect from June, 1917, to 1935. We shall not discuss here the earlier arrangements.

located in New York and Chicago, reserve city banks are those located in about 60 other specified large cities; country banks are those located elsewhere.[2] The minimum percentages of reserves required against demand deposits were fixed at 13 percent for central reserve city banks, 10 percent for reserve city banks, and 7 percent for country banks.

The Banking Act of 1935 empowered the Board of Governors to alter the reserve requirements of any class or of all classes of member banks. However, it placed limits on these alterations, providing that the percentages required should not be fixed below those already prevailing or at more than twice those already prevailing. Thus, the Board of Governors could vary member-bank reserve requirements within the following limits:

Reserve	Lowest Level at which Requirements May Be Set (percent)	Highest Level at which Requirements May Be Set (percent)
On net demand deposits		
At central reserve city banks	13	26
At reserve city banks	10	20
At country banks	7	14
On time deposits		
At all member banks	3	6

Legislation enacted in 1959 changed these arrangements in three principal ways:

1. It empowered the Board of Governors to allow member banks to count cash in vault as legal reserves. Since November 24, 1960, all member-bank cash in vault has been included in legal reserves.
2. It ordered the Federal Reserve to discontinue the "central reserve city" category and to apply to member banks in those cities (New York and Chicago) the reserve requirements applicable to member banks in reserve cities. This was done on July 28, 1962.
3. It provided that the Board of Governors should set reserve requirements against demand deposits in banks in reserve cities at not less than 10 percent nor more than 22 percent.

Thus, under existing legislation, the Board of Governors is empowered to set and alter member-bank reserve requirements within the following limits:

[2] In some cases banks in the outlying areas of large cities are placed in a category with lower reserve requirements. Thus, a bank located in an outlying area of New York or Chicago may be classified as a reserve city bank or even as a country bank.

Reserve	Lowest Level (percent)	Highest Level (percent)
On net demand deposits		
Central reserve and reserve city banks	10	22
Country banks	7	14
On time deposits		
All member banks	3	6

As shown in Table 10–1, the Board first used this power in 1936 and has since employed it many times. Sometimes it raised reserve requirements to eliminate some or all excess member-bank reserves and even to create a deficiency of bank reserves. At other times it reduced these requirements, thereby tending to create excess reserves for member banks. Table 10–1 reveals two other things worth noting. First, the Board of Governors soon raised requirements toward the top of the permitted range and kept them near the top until about 1953. Second, the Board has reduced reserve requirements many times since 1953, but has raised them only once. And even this one increase, raising reserve requirements against demand deposits in country banks from 11 percent to 12 percent, was coupled with an action permitting these banks to count, for the first time, all their cash in vault as legal reserves.

Changes in member-bank reserve requirements are a powerful instrument for monetary management. Even a change of one percentage point can have a marked effect on monetary and credit conditions. To illustrate this, let us start with a situation in which member banks have neither excess reserves nor a deficiency of reserves, their deposits subject to reserve requirements total $150 billion, their average reserve requirement is 14 percent, and their actual reserve balances are $21 billion. Suppose now that the Board of Governors lowers average reserve requirements to 13 percent. This reduction of one percentage point decreases required reserves by $1.5 billion, thereby creating an equal amount of excess reserves. If the average percentage reserve requirement remains at this new lower level of 13 percent and the banking system suffers no net cash drain in the process of expansion, this $1.5 billion of excess reserves would enable the banks to expand both their earning assets and their deposits by ($1.5 billion)/0.13, or about $11.5 billion. This would surely tend to increase the availability of credit and to lower market rates of interest.

Suppose, on the other hand, that the Board of Governors raises the average reserve requirements of member banks from 14 percent to 15 percent. This rise of one percentage point will increase required reserves by $1.5 billion, thereby creating a reserve deficiency of that amount. If

TABLE 10–1. Member-Bank Reserve Requirements
(percent of deposits)

Period in Effect	Net Demand Deposits[a] Central Reserve City Banks	Reserve City Banks	Country Banks	Time Deposits (all member banks)
June 21, 1917 – Aug. 15, 1936	13	10	7	3
Aug. 16, 1936 – Feb. 28, 1937	19½	15	10½	4½
Mar. 1, 1937 – Apr. 30, 1937	22¾	17½	12¼	5¼
May 1, 1937 – Apr. 15, 1938	26	20	14	6
Apr. 16, 1938 – Oct. 31, 1941	22¾	17½	12	5
Nov. 1, 1941 – Aug. 19, 1942	26	20	14	6
Aug. 20, 1942 – Sept. 13, 1942	24	20	14	6
Sept. 14, 1942 – Oct. 2, 1942	22	20	14	6
Oct. 3, 1942 – Feb. 28, 1948	20	20	14	6
Feb. 28, 1948 – June 11, 1948	22	20	14	6
June 11, 1948 – Sept. 16, 1948	24	20	14	6
Sept. 16, 1948 – Sept. 24, 1948	24	20	16	7½
Sept. 24, 1948 – May 1, 1949	26	22	16	7½
Sept. 1949 – Jan. 11, 1951[b]	22	18	12	6
Jan. 11, 1951 – Jan. 16, 1951	23	19	12	6
Jan. 16, 1951 – Jan. 25, 1951	23	19	13	6
Jan. 25, 1951 – Feb. 1, 1951	24	20	13	6
Feb. 1, 1951 – July 1, 1953	24	20	14	6
July 1, 1953 – July 9, 1953	24	20	13	6
July 9, 1953 – June 16, 1954	22	19	13	6
June 16, 1954 – June 24, 1954	22	19	13	5
June 24, 1954 – July 29, 1954	21	19	13	5
July 29, 1954 – Aug. 1, 1954	20	18	13	5
Aug. 1, 1954 – Feb. 27, 1958	20	18	12	5
Feb. 27, 1958 – Mar. 1, 1958	19½	17½	12	5
Mar. 1, 1958 – Mar. 20, 1958	19½	17½	11½	5
Mar. 20, 1958 – Apr. 1, 1958	19	17	11½	5
Apr. 1, 1958 – Apr. 17, 1958	19	17	11	5
Apr. 17, 1958 – Apr. 24, 1958	18½	17	11	5
Apr. 24, 1958 – Sept. 1, 1960	18	16½	11	5
Sept. 1, 1960 – Nov. 24, 1960	17½	16½	11	5
Nov. 24, 1960 – Dec. 1, 1960	19½	16½	12	5
Dec. 1, 1960 – Oct. 25, 1962	16½	16½	12	5
Oct. 25, 1962, and after	16½	16½	12	4

[a] Demand deposits subject to reserver requirements, that is, demand deposits minus cash item in process of collection and demand balances due from domestic banks.
[b] The reductions between May and September, 1949, were made in several steps.

average reserve requirements remain at the new higher level, if member banks are unable to secure new reserves, and if the process of contraction induces no net inflow of cash, the banks will be forced to contract both their earning assets and their deposits by ($1.5 billion)/0.15, or $10

billion. This would produce decreases in the availability of credit and higher market rates of interest.

This instrument is well adapted to two purposes. The first is to absorb large excess reserves or to offset large losses of reserves by the banking system. For example, in the late 1930s, owing largely to huge gold inflows, member banks accumulated several billions of excess reserves, far more than the Federal Reserve could have eliminated by selling all its government securities and other earning assets. Large increases in member-bank reserve requirements served a useful purpose in absorbing most of these excess reserves and in reducing the potential expansion of bank credit on the basis of the excess reserves that remained. Reductions of reserve requirements might be similarly useful if the banks should at some time suffer large losses of reserves. A second purpose for which this instrument is well adapted is for announcing important policy decisions to both the public and the banks. Changes in reserve requirements are overt and well-publicized actions that the public can understand and that immediately affect the reserve positions of thousands of banks. They are, therefore, an effective way in which the Board of Governors can in effect say, "This is the direction our policy is taking and we really mean it!"

In general, this instrument is employed only infrequently, and then only to bring about relatively large changes in the reserve positions of banks; it is not used for day-to-day or week-to-week adjustments. In part, this is because it has acquired the reputation of being "more like an ax than a scalpel." This reputation, which dates largely from the late 1930s when requirements were changed several percentage points at a time, is not wholly justified. More delicate adjustments can be made if the changes are smaller, announced well in advance, and made effective in steps. Nevertheless, Federal Reserve officials prefer to rely largely on open-market operations and discount policy for their finer and day-to-day adjustments.

Of all the restrictive measures available to the Federal Reserve, increases in member-bank reserve requirements are by far the most unpopular with member bankers. Bankers view required reserves as sterile assets that yield no return, and they resent any requirement that a larger percentage of their assets be held in this form. The resentment of member bankers is increased by their feeling that their higher reserve requirements place them at a competitive disadvantage. They point out that nonmember banks generally have lower reserve requirements against both demand and time deposits, and they complain bitterly that their higher reserve requirements against time and savings deposits place them at a competitive disadvantage with mutual savings banks, savings and loan

associations, and credit unions in bidding for savings. Federal Reserve officials are somewhat influenced by these attitudes of member bankers and also by the danger that higher reserve requirements might influence some member banks to withdraw from the System and some nonmembers to refrain from joining.

Most, though not all, economists agree that the power of the Federal Reserve to alter member-bank reserve requirements is a useful instrument of monetary management. However, several reforms are widely advocated, among which are the following:

1. Discrimination should be eliminated by applying the same reserve requirements to the same types of liabilities, regardless of the institutions issuing them. One way of eliminating discriminatory reserve requirements against demand deposits is to require all commercial banks to become members of the Federal Reserve. Another is to require all commercial banks, whether member or nonmember, to meet the same reserve requirements. Some have also proposed that all savings accounts, whether at the commercial banks or elsewhere, should be subject to the same reserve requirements.

2. The present classification of member banks for purposes of fixing reserve requirements should be eliminated and the same reserve requirements against demand deposits should be applied to member banks in all locations. The present system, based on the outmoded theory that the purpose of required reserves is to provide liquidity, has no rational basis.

In summary, the power of the Board of Governors to alter reserve requirements is a powerful and useful instrument of monetary management. It is especially useful for offsetting very large changes in the volume of bank reserves and for announcing important changes in the direction of Federal Reserve policy. However, it is not likely to be used frequently or for day-to-day adjustments.

OPEN-MARKET OPERATIONS

We turn now to the instruments used by the Federal Reserve to regulate the cost and dollar volume of member-bank reserves. The most important of these are open-market purchases and sales of acceptances and government securities, largely the latter. We shall discuss in detail only operations in government securities; the same principles apply to Federal Reserve purchases and sales of acceptances.

Some Mechanics

As noted earlier, Federal Reserve open-market operations are controlled by the Federal Open-Market Committee (hereafter referred to as the FOMC), which is composed of the seven members of the Board of

Governors, the president of the Federal Reserve Bank of New York, and four other presidents of Reserve banks. The FOMC meets in Washington at least once every three weeks, and its members communicate with each other much more frequently, usually daily, by telephone. This body determines open-market policy, setting its objectives and prescribing in a general way the nature and magnitude of the actions to be taken. Actual purchases and sales are made by the manager of the open-market account, who is a vice-president of the Federal Reserve Bank of New York, but is accountable to the FOMC. Because New York is the nation's great financial center, almost all transactions occur there. In buying and selling, the manager deals with about 18 government security dealers. These dealers are at the center of a national and even international market for United States government obligations. They purchase these securities from, and sell them to, all sorts of institutions and people located in all parts of the United States and in foreign countries: the United States Treasury, foreign sellers and buyers, the Federal Reserve, commercial banks, insurance companies, savings banks, savings and loan associations, pension funds, nonfinancial business firms, individuals, and others. The manager of the open-market account is thus in a position to use open-market operations in a highly timely and flexible manner. He can buy or sell quickly, change quickly his rate of purchases or sales, and shift quickly from buying to selling, or vice versa.

When the manager of the open-market account purchases government securities from a dealer, he pays the dealer with a check on the Federal Reserve Bank of New York. The dealer must, of course, pay these funds to the seller of the securities. If the seller is a commercial bank, the immediate effect is to increase the volume of bank reserves. If the seller is someone other than a bank, the effect is to increase directly both the public's money supply and the dollar volume of bank reserves, for the seller will deposit the check with his bank, which will deposit it at a Reserve bank. Sales of government securities by the manager of the open-market account have the opposite effect. The dealer who sells the securities to the Federal Reserve pays for them, in effect, with funds that he receives from the buyer to whom he sells the securities. If the buyer is a commercial bank, the effect is to reduce bank reserves. If the buyer is someone other than a bank, the effect is to reduce directly both bank reserves and the public's money supply. In effect, the dealer pays the Federal Reserve with a check received from a customer of some bank, the Federal Reserve deducts the check from the bank's reserve account and sends the check to the bank, which deducts it from the customer's deposit account.

Though these transactions occur in New York City, their effects are by no means confined to that area. Those who sell the government securities purchased by the Federal Reserve and thereby gain Federal Reserve funds may be located at any place within the country. So may those who buy the government securities from the Federal Reserve and thereby lose Federal Reserve funds. Moreover, the effects will be spread throughout the banking system and the financial markets regardless of the geographic location of the institution or person selling securities to, or buying securities from, the Federal Reserve. This happens because the banks that receive the reserves created by Federal Reserve purchases will lose reserves to other banks as they expand their own loans and security holdings. And banks that lose reserves because of Federal Reserve sales will draw reserves from other banks as they contract their credit. These processes may, of course, require some time.

Federal Reserve open-market operations are of two principal types: "outright" purchases and sales, and acquisitions under "repurchase agreements." Outright purchases and sales, which make up by far the larger part of the total, are ordinary transactions in which neither the buyer nor the seller commits himself to resell or rebuy. The transaction is final. In some cases, however, the Federal Reserve buys securities from a dealer with an agreement that the dealer will repurchase the securities within a stipulated period, which never exceeds 15 days. This is much like a short-term loan to the dealer. A sort of interest charge is made, approximately equal to the discount rate at the Federal Reserve Bank of New York, by paying the dealer a price below that at which he is obliged to repurchase the security. Federal Reserve officials regard money created in this way as "dollars with strings on them," for the very purchases that involve the issue of the dollars make provision for return of the dollars on a stipulated date. Acquisitions under repurchase agreements are a useful instrument for at least two purposes. For one thing, they are a convenient way of supplying funds to meet a temporary need, and of withdrawing funds when the need has passed.

For example, the Federal Reserve may acquire securities under repurchase agreements during the week before Christmas when currency is being drained from the banks, arranging for dealers to repurchase the securities just after Christmas when large amounts of currency flow back into the banking system. This device is also useful for avoiding disorderly changes in the market prices of government securities. Dealers in these securities ordinarily hold inventories far larger than they can finance with their own capital funds. They rely heavily on borrowed money. If at some time they could not borrow sufficient funds, or could do so only at very

high rates of interest, they might dump large amounts of their inventory on the market, thereby disturbing seriously not only government security prices but also money market conditions in general. Judicious Federal Reserve acquisitions under repurchase agreements can help avoid such occurrences.

Federal Reserve outright open-market operations are either "regular way" or "cash." Purchases or sales in the "regular way" call for payment and delivery of the securities on the day following the transaction. Such purchases or sales thus involve a one-day delay in putting money into the market or taking it out of the market. However, in purchases or sales for "cash," the securities are delivered and payment is made or received on the day of the transaction. The availability of these various arrangements contributes to the timeliness and flexibility of open-market operations.

Effects of Federal Reserve Purchases or Sales

Federal Reserve purchases or sales of Government securities may have three types of direct effects: (1) effects on the dollar volume of bank reserves, (2) impact effects on the price and yield of the particular type of security bought or sold, and (3) effects on expectations concerning the future behavior of security prices and yields. In some cases, one or more of these effects may fail to appear, but when they do, they may be powerful or weak, desired or undesired, anticipated or unanticipated.

Effects on the volume of bank reserves appear in every case and are usually the most powerful, for every change of one dollar in bank reserves is the basis for a change of several dollars in the money supply and bank credit. It is for this reason that throughout we shall stress the effect of open-market operations on the reserve position of the banking system. However, it would in some cases be a mistake to ignore the other effects.

When the Federal Reserve buys or sells a particular type of government security, the impact or initial tendency is to change the price and yield of that particular security. This effect may be negligible if the amount purchased or sold is very small relative to the total supply, but it may be significant if the operation is larger relative to the supply. Suppose, for example, that the Federal Reserve purchases a large amount of government securities in the 10-year maturity range. This may be described as an increase in the demand for that type of security. Or it may be described as a decrease in the supply of the security available to meet private demands. In any case, the initial tendency is to raise the price of the security and lower its yield. This impact effect is likely to be moderated and spread to other securities through private arbitrage. Private investors will tend to shun this security, and even to sell it, until its yield

is as attractive as yields on other securities. However, this process may be time-consuming and imperfect, especially if the impact effects were very large. Comparable processes may be involved if the Federal Reserve sells large amounts of a particular security.

Federal Reserve attitudes toward the impact effects of its purchases and sales on the prices and yields of particular securities or groups of securities have varied widely. During much of its history the Federal Reserve has sought to avoid, or at least to minimize, them. To this end, it has often confined its operations to short maturities, where the impact effects are expected to be small, and has spread its purchases or sales over time. At other times, it has consciously used this power to influence directly the prices of particular securities or groups of securities. For example, it has often bought or sold to prevent or ameliorate "disorderly movements" of security prices. From 1942 to 1951, it even went so far as to "peg" the prices and yields on long-term government securities within narrow limits. It has also engaged in "swap operations," sales of securities in one maturity range offset by purchases of securities in another maturity range. For example, in the early 1960s it sold Treasury bills and other short-term securities in order to hold down their prices and support their yields, at the same time buying long-term securities in order to support their prices and hold down their yields. We shall see later that some Federal Reserve efforts to affect directly the behavior of the prices and yields of securities have jeopardized its ability to control the volume of bank reserves.

Federal Reserve open-market operations may also influence the behavior of security prices and yields by influencing private expectations. These are often called "announcement" effects. Suppose, for example, that private investors see that the Federal Reserve has begun to purchase large amounts of securities with the apparent purpose of easing credit. If they come to believe that the policy will continue and will succeed, private investors will be impelled to increase their demands for securities, thereby increasing the flow of loanable funds, supporting the rise of security prices, and reinforcing the decline of yields. On the other hand, large Federal Reserve sales of securities may create expectations of higher interest rates in the future, which will tend to decrease private demands for securities and tighten credit further.

Patterns of Open-Market Operations

The Federal Reserve can use its powers to buy and sell in the open market in many different ways, with quite different consequences for financial markets and the economy. We shall explore only a few of the

possible patterns. The first is one in which the Federal Reserve retains precise control of the amount of securities held. Members of the FOMC might describe it this way: "We shall determine the amount of securities that we hold, the types and amounts that we buy and sell, and when we buy and sell. We retain the initiative and will not buy or sell simply because others wish to sell to us or buy from us." Under such a policy the Federal Reserve can control accurately the volume of its holdings and also bank reserves, but the prices and yields on securities can fluctuate in response to changes in demand and supply relationships in the market.

Another and very different pattern is the one in which the Federal Reserve passively buys and sells some security or group of securities at a fixed price and yield. For example, the FOMC might say, "At this price and yield on long-term government securities we shall buy all offered to us and shall sell all demanded from us." While such a poicy is in effect, the price of the selected security or group of securities obviously cannot fall below the price at which the Federal Reserve will buy nor can it rise above the price at which it will sell. However, the Federal Reserve, in adopting such a policy, loses control over both the volume of its security holdings and the volume of bank reserves. It must hold all the security that others issue and that others do not want to hold at the fixed price and yield levels. As passive buyer and seller it surrenders control over the volume of its holdings.

We shall later consider other patterns of open-market operations and some of the problems faced by the Federal Reserve in determining which pattern to follow. However, two points should be emphasized here.

1. The System must choose between accurate control of the volume of its holdings of government securities on the one hand and stabilization of interest rates on the other. If it is to control accurately the volume of its holdings, it must allow the prices and yields of government securities to fluctuate in response to changes in the supply of, and demand for, these obligations. If it is to stabilize their prices and yields, it must abandon accurate control of the volume of its holdings and passively buy or sell all the securities offered to it, or demanded from it, at the selected level of prices and yields. In this case, the initiative is with other investors, for it is they who determine the volume of securities offered to, or demanded from, the Federal Reserve. This means, of course, that they also determine the volume of bank reserves.

2. As long as investors can shift freely between government securities and other obligations, the Federal Reserve can dominate the entire structure of interest rates by regulating yields on the federal debt. This debt now makes up about a quarter of all the outstanding interest-bearing debt

of the country, and is equal to many times the annual increase in total debt. If the Federal Reserve buys and sells these securities freely in such a way as to maintain a certain structure of yields on them, it also establishes, within narrow limits, the structure of yields on other debts. The reason for this is that private investors are free to arbitrage among the various branches of the debt market, to sell in one and buy in another until they see no further advantage in shifting their funds. This applies not only to banks but to other investors as well. In short, Federal Reserve operations in the government securities market can dominate the entire money market. However, we shall see later that if this power is used to stabilize interest rates, the effect may be to destabilize the rest of the economy.

Defensive and Dynamic Open-Market Operations

As noted earlier, defensive open-market operations are those undertaken by the Federal Reserve to prevent other factors, such as changes in the gold stock or in currency in circulation outside the banks, from bringing about unwanted changes in the reserve positions of banks. Dynamic operations are those aimed at altering the reserve positions of banks. This distinction is useful in emphasizing that not all Federal Reserve purchases and sales are designed to bring about net increases or decreases in bank reserves. In fact, many of them are purely defensive.

However, it would be misleading to overemphasize the distinction. The two are closely related, and some actual transactions arc partly defensive and partly dynamic. For example, suppose the monetary gold stock decreases by $500 million, lowering bank reserves by that amount. The Federal Reserve must decide how to respond. If it wants restriction of credit, it may do nothing. In fact, if the gold outflow had not occurred it might have engaged in a dynamic open-market sale of securities to restrict credit. However, if it wants easier credit conditions, it may buy $750 millions of securities. Perhaps $500 million of these purchases should be called defensive; the other $250 million, dynamic. This illustrates the point that, in practice, it is often difficult to distinguish clearly between dynamic and defensive transactions.

DISCOUNT POLICY AND DISCOUNT RATES

We have already noted that the Federal Reserve can create bank reserves by increasing its loans and discounts and can destroy bank reserves by decreasing its outstanding loans and discounts. Though the Federal Reserve now relies primarily on open-market operations to regulate the

volume of bank reserves, its discount policy remains important. Federal Reserve discount policy refers to the terms and conditions on which it will lend. It has two major components. The first is discount rate policy. As noted earlier, the discount rate is simply the interest rate charged by the Reserve banks on their loans. Increases in discount rates raise the cost of acquiring reserves by borrowing, whereas decreases in discount rates make it cheaper for banks to acquire reserves in this way. The second component of discount policy includes all methods other than discount rates that are used to regulate the amount of central bank loans. These are of several types. One is "moral suasion," that is, official pronouncements and other communications designed to influence the volume of member-bank borrowing. For example, at one time Federal Reserve officials may make it clear that they welcome applications for loans. At another time they may indicate their disapproval. Or they may resort to outright rationing of their loans.

Central banks differ greatly in the extent to which they rely on discount rates and on other methods to regulate the volume of their loans and discounts. Also, the role of the discount rate and the effects of discount rate changes are strongly influenced by the extent to which other methods of control are used.

Under certain conditions, a central bank's discount rate could regulate with accuracy the level of market rates of interest, or at least of short-term interest rates. Suppose, for example, that two conditions obtain: (1) The central bank stands ready to lend freely at its established discount rate; it uses no other rationing methods and relies on the discount rate alone to regulate the volume of its loans. (2) Commercial banks have no inhibitions against borrowing from the central bank. Intent on maximizing their profits, they borrow from the central bank and lend whenever market rates of interest exceed the discount rate by an amount sufficient to cover the cost of risk-bearing and loan administration. They also withdraw loans from the market and repay their borrowings at the central bank whenever market rates of interest are not sufficiently higher than the discount rate. Under such conditions, the central-bank discount rate could dominate market rates of interest. Increases and decreases in the discount rate would almost automatically raise or lower market rates of interest. Moreover, discount rates would be the central bank's sole method of regulating the volume of bank reserves that it created by lending.

These are not the conditions in American banking, and the Federal Reserve discount rate does not play exactly this role. Member banks do have inhibitions against large and continuous borrowings from their

Reserve banks. Even before the establishment of the Federal Reserve there was a "tradition against continuous borrowing," a feeling that it was "unsound" for a bank to borrow continuously to extend its own lending power. Federal Reserve officials have maintained and strengthened this tradition. They have stated repeatedly that borrowing is a privilege and not a right, that a member bank should not borrow simply because it is profitable to do so, that a bank should not borrow large amounts for long periods, and that, generally speaking, a bank should borrow only to meet drains that it could not foresee, and even then for only short periods. A recent statement of these principles was included in a foreword to regulations issued by the Board of Governors concerning member-bank borrowing.

> Federal Reserve credit is generally extended on a short-term basis to a member bank in order to enable it to adjust its asset position when necessary because of developments such as a sudden withdrawal of deposits or seasonal requirements for credit beyond those which can reasonably be met by use of the bank's own resources. Federal Reserve credit is also available for longer periods when necessary in order to assist member banks in meeting unusual situations, such as may result from national, regional or local difficulties or from exceptional circumstances involving only particular member banks. Under ordinary conditions, the continuous use of Federal Reserve credit by a member bank over a considerable period of time is not regarded as appropriate.
>
> In considering a request for credit accommodation, each Federal Reserve bank gives due regard to the purpose of the credit and to its probable effects upon the maintenance of sound credit conditions, both as to the individual institution and the economy generally. It keeps informed of and takes into account the general character and amount of the loans and investments of the member bank. It considers whether the bank is borrowing principally for the purpose of obtaining a tax advantage or profiting from rate differentials and whether the bank is extending an undue amount of credit for the speculative carrying of or trading in securities, real estate, or commodities, or otherwise.

A Reserve bank rarely refuses to lend to a member bank that is facing an actual or prospective deficiency in its reserves. But after making a short-term loan to a bank, it studies the situation carefully. If it finds that the bank has borrowed too often, too continuously, too much, or for improper reasons, it may advise the bank to contract its loans or sell securities in order to reduce or retire its borrowings. It may even go as far as to refuse to renew the loan, and in extreme cases it may suspend the bank's borrowing privilege.

Federal Reserve officials could, of course, attempt to regulate the volume of member-bank borrowing by varying their own attitudes toward lending, being very strict at some times and more liberal at others.

Though this is done to some extent, it is not a very flexible or effective instrument.

This combination of member-bank inhibitions against large and continuous borrowing from the Federal Reserve and the latter's unwillingness to make such loans to a member helps explain several things about monetary policy in the United States. (1) When member-bank borrowings from the Federal Reserve are large, credit is usually "tight." Credit is, of course, less tight than it would have been if the banks had not been able to borrow and secure reserves, but it is tighter than it would have been if the banks had had the same volume of reserves without borrowing. (2) The role of discount rates in regulating the volume of bank reserves is reduced in importance. The Federal Reserve does not rely solely on increased discount rates to limit member-bank borrowing. And because of the tradition against continuous borrowing, decreases in discount rates may not be very effective in inducing larger member-bank borrowings.

It would be a mistake to dismiss changes in discount rates as ineffective and useless and to rely solely on the tradition against continuous borrowing and on Federal Reserve admonitions to regulate the amount of member-bank borrowing. For one thing, it appears that some banks are willing to violate the tradition if this is sufficiently profitable. For example, a bank faced with large loan demands from its customers, at rates well above the discount rate, may borrow large amounts as long as it can. Moreover, total borrowings from the Federal Reserve may increase by several hundred millions even though no individual member bank remains continuously in debt. Banks may "pass the borrowing around," with first one group of banks and then another borrowing temporarily.

Changes in discount rates remain important and influence the economy in several ways:

1. They do have some effect on the volume of member-bank borrowings from the Federal Reserve. A member bank with an actual or prospective deficiency in its reserves can repair its reserve position in either of two general ways: by borrowing or by selling some of its earning assets, such as short-term government obligations. It is tempted, despite the tradition against continuous borrowing, to repair its reserves in the cheapest way. If the Federal Reserve discount rate is lower than the yield it would have to sacrifice by selling some of its earning assets, a member bank may elect to borrow from the Federal Reserve and may be in no hurry to repay its borrowings. This is especially true of banks that have not been borrowing continuously and therefore fear no early chastise-

ment by Federal Reserve officials. The result can be a significant increase in member-bank borrowings and reserves and a minimum of pressure toward credit restriction. However, if the discount rate is higher than the yields on assets that the banks might sell to repair their reserve positions, many banks will not borrow and will repay their borrowings quickly. They will attempt to repair their reserve positions by calling loans or selling securities. The result may be to decrease member-bank borrowings and to enhance restrictive pressures.

2. Changes in discount rates can be an effective way of announcing to both the banks and the public the direction of Federal Reserve policy. Open-market operations are not well suited to this purpose, partly because they are not widely understood and partly because dynamic operations are often obscured for some time by defensive operations. On the other hand, changes in discount rates are widely publicized as soon as they occur, and are generally believed to be important. In fact, many exaggerate their importance. An increase in discount rates is generally interpreted as meaning that the Federal Reserve is moving toward tighter credit and higher interest rates. This may lead some lenders to restrict their loans, hoping for higher interest rates in the future. A reduction of discount rates, presaging an easier monetary policy and lower interest rates, may induce some lenders to increase immediately their willingness to lend. Of course there is the possibility that changes in discount rates will have perverse announcement effects. For example, if an increase in discount rates is interpreted to mean that Federal Reserve officials believe inflation is coming, such an action might encourage people to borrow and spend, thereby increasing the danger of inflation. If a decrease in discount rates is taken as a forecast of business recession, it could encourage a reduction of spending and hasten a business decline. However, such perverse announcement effects are likely to occur only if changes in discount rates create expectations about the trend of business that the public would not have had anyway, and if the public believes the Federal Reserve will not be able to achieve its objectives. The public has so many other sources of information that it would usually know about dangers of inflation or recession even if the Federal Reserve did nothing to announce its intention of combating such disturbances.

3. Changes in discount rates affect market rates of interest in various ways. We have already noted that increases or decreases in this rate may affect lenders' expectations about future rates and immediately cause them to lend less liberally or more liberally. There are other effects as well. A few (but only a few) long-term debt contracts escalate their

interest rates with the Federal Reserve discount rate. The other principal effects are less direct, but nevertheless important. For example, an increase in the discount rate increases the bargaining power of lenders relative to borrowers. A banker can argue, "I have to charge you more because I have to pay more when I borrow." Nonbank lenders may insist that, "even the Federal Reserve recognizes that credit is scarcer and interest rates should go up." Reductions in discount rates generally increase the bargaining power of borrowers and tend to bring down "sticky" rates of interest, such as those on loans by banks to their large and medium-sized customers. They are less effective in reducing rates to small borrowers.

MORAL SUASION

In many countries with only a handful of commercial banks, the central bank relies heavily on moral suasion to accomplish its objectives. It can confer informally with responsible officials of the five or ten important commercial banks and persuade them to follow policies that it considers appropriate. For example, it may get them to agree to limit their borrowing from the central bank, to refrain from expanding their loans or even to contract them, or to lend less liberally for some purposes than for others. Such techniques of monetary management are not well adapted to the American system, with its thousands of widely scattered banks, more than half of which are not members of the Federal Reserve. Nevertheless, Federal Reserve officials often use moral suasion to supplement their other policies. At times, they use publicity, interviews, and other devices to persuade banks to borrow less and to tighten their credit policies. On a few occasions, as in 1947 and in 1951, they have encouraged banks and other lenders to follow "voluntary credit restraint programs" to curtail "nonessential credit." At other times, they attempt to persuade banks to follow more liberal lending policies.

Moral suasion can be a useful supplement to other Federal Reserve actions, but it is unlikely to be an effective substitute for them.

COORDINATION OF THE INSTRUMENTS OF GENERAL MONETARY MANAGEMENT

We have now discussed the three major Federal Reserve instruments of general monetary management: changes in member-bank reserve requirements, open-market operations, and discount policy. We turn now to a consideration of the interrelationships of these instruments and the coordination of their use.

Methods of Coordination

If one looks only at the legal provisions of the Federal Reserve Act, he may fear that these instruments will not be used in a coordinated way, for authority over them is not fully centralized. Member-bank reserve requirements are set by the Board of Governors alone. Open-market operations are controlled by the FOMC. Discount rate changes are usually initiated by the 12 Federal Reserve banks, subject to approval by the Board of Governors. Loan officers at the 12 Reserve banks decide whether or not to make specific loans to member banks, though they operate under general regulations prescribed by the Board of Governors. There is far more coordination than this dispersion of legal authority suggests, and it is achieved in many ways, both formal and informal. In this process, the Board of Governors plays a central role. With full authority over member-bank reserve requirements, a majority of the members of the FOMC, power to approve or disapprove discount rates, and authority to prescribe regulations for lending to member banks, its legal powers are formidable. It is also in a position to persuade other Federal Reserve officials to cooperate. Officials of the various Reserve banks also confer frequently among themselves and with the Board, exchanging information and points of view.

In this process, the meetings of the FOMC, held in Washington at least once every three weeks, are very important. These meetings are attended not only by the members of the FOMC, but also by the seven presidents of Reserve banks not currently members of the FOMC, the principal economists on the Board's staff, and an economist from each of the Reserve banks. The presidents who are not members of the FOMC are free to discuss, but not to vote. For two days those assembled analyze current and prospective financial and economic conditions and discuss various policy alternatives. By the end of the meeting, they all know what the open-market policy will be, probably also the Board's intentions with respect to member-bank reserve requirements, the Board's attitude toward discount rates, and even the intentions of the various presidents with respect to the discount rates they will recommend to their boards of directors. In these and various other ways, a high degree of coordination is achieved. However, a greater degree of centralization of authority is often advocated to achieve even greater coordination.

Importance of Coordination

The various instruments of monetary policy may be used singly or in various combinations, and they may supplement each other or tend to weaken each other. For example, if the Federal Reserve wishes to restrict

credit, it may raise reserve requirements, sell securities in the open market, increase discount rates, or take these actions in various combinations. The net effects of using one instrument depend in part on current policies with respect to the others. Suppose the Federal Reserve increases member-bank reserve requirements enough to absorb existing excess reserves and put many banks in a deficient reserve position. Banks may be forced to restrict credit sharply if the Federal Reserve refuses to create additional reserves by purchasing securities and if it raises discount rates to discourage borrowing. However, the restrictive effects may be largely negated if the Federal Reserve stands ready to buy at fixed prices and yields all the government securities offered to it. And the degree of restriction will be lessened if the Federal Reserve fails to raise discount rates or to take other actions to restrict member-bank borrowing.

To take another example, suppose that the Federal Reserve, faced with actual or threatened inflation, sells enough securities in the open market to absorb any existing excess reserves and to put some banks in a deficient reserve position. The degree of credit restriction will be greater if the Federal Reserve keeps its discount rates high relative to market rates than it would be if discount rates were left unchanged while market rates rose.

These examples indicate the importance of proper coordination in the use of the various instruments. Proper coordination does not require that all the instruments be used in every case. It requires only that the instruments not be used in such a way as to prevent the achievement of desired results. In many cases, the Federal Reserve can achieve its objectives by using only one or two of these instruments. Open-market operations are often used alone, especially for defensive purposes or where only small dynamic effects are desired. For larger operations, they are ordinarily combined with changes in discount rates. In some cases, and especially when much easier monetary conditions are desired, both will be combined with changes in member-bank reserve requirements. Though there is no invariable sequence in its use of these instruments, the Federal Reserve usually "leads off" with open-market operations and then adjusts its discount rate as market conditions are changed.

A later chapter will describe in detail the purposes for which the Federal Reserve has used its powers and the ways it has used its instruments. The succeeding examples will illustrate a few of the patterns of Federal Reserve restrictive and expansionary policies.

Restrictive Policies

Suppose the United States is experiencing a business boom of such strength as to bring actual or threatened inflation. Such periods are

usually characterized by high or rising demands for credit, including bank credit.

The Federal Reserve may respond by following a policy popularly described as "passive resistance" or "leaning against the wind." Like most popular terms, these lack precise meaning. In general, however, they mean that the Federal Reserve takes no action to increase the money supply in the face of rising demands and takes no actions to decrease it. It "lets the market tighten itself" as demands for credit rise and the community, with higher levels of money income, wants larger total money balances. Such a passive Federal Reserve policy is unlikely to prevent some further increase in the rate of expenditures for output. For one thing, the income velocity of the existing money supply usually rises in such periods. Rising interest rates induced by increasing demands for credit induce business firms and individuals to reduce their holdings of idle balances and to hold earning assets instead. Greater optimism as to future earnings and incomes also contribute to the rise of velocity. Moreover, the banks are likely to expand the money supply somewhat by expanding on the basis of any excess reserves that existed before. They will also increase their borrowings at the Federal Reserve if the discount rate is kept constant or fails to keep pace with rising interest rates in the market. Thus, failure of the Federal Reserve to raise discount rates at least as much as market rates have risen tends to increase the profitability of member-bank borrowing and to encourage increases in the money supply. Constant discount rates in the face of rising market rates of interest, induced by increasing demand functions for credit, is certainly not a "neutral" monetary policy.

If actual or threatened inflationary pressures are large, the Federal Reserve may be impelled to reduce the money supply, or at least to take positive steps to prevent further increases. It could, of course, raise member-bank reserve requirements. However, this is rarely done when the Federal Reserve is in a position to use its other instruments for restriction. One reason is the opposition of bankers to such actions; another is fear that it might be too restrictive. The Federal Reserve ordinarily "leads off" by selling securities in the open market, thereby decreasing bank reserves. Some banks that formerly had excess reserves now have fewer of them, or none at all, and some find themselves with deficient reserves. As banks lose reserves while customer demands for loans are high and perhaps rising, they will try to adjust in various ways. Some may quickly restrict their loans to customers. More are likely to try to repair their reserve positions and meet customers' demands by selling government securities and other open-market instruments, there-

by tending to raise interest rates in the open market. At least some will try to repair their reserves and meet customers' demands by borrowing from the Federal Reserve. At this stage, if not before, the Federal Reserve will raise discount rates. It may say that it is merely adjusting its discount rates to changes in market rates, but the rise of market rates was brought about (at least in part) by Federal Reserve sales of securities, and the increase of discount rates makes it more expensive for banks to borrow reserves. If the Federal Reserve wishes to achieve a high degree of restriction from its sales of securities, it should keep its discount rates continuously above the yields on government securities and other assets that the banks are most likely to sell in attempts to repair their reserve positions.

Expansionary Policies

Suppose now that the country is slipping into a recession, following a prosperity period in which interest rates, including discount rates, were relatively high and member-bank borrowings were large. Such recession periods are usually characterized not only by declining business activity and rising unemployment, but also by declining demand functions for credit, which tend to lower market rates of interest. If the Federal Reserve neither lowers discount rates nor takes other positive action, it will encourage decreases in the money supply. Faced with declining demands for credit and falling interest rates, banks that were willing to borrow and lend when interest rates were high relative to discount rates will now seek to repay their debts to the Federal Reserve. Some banks may also want to hold some excess reserves if they think lending is becoming riskier. Thus, the Federal Reserve must take some positive liberalizing action if it is to prevent an actual decrease in the volume of money and bank credit and still more positive action if it is to induce an expansion.

Which instruments the Federal Reserve will use, the sequence in which it will use them, and the scope of its actions will depend on its estimate of the strength and probable duration of the depressive forces. If it fears that the recession will be serious and prolonged, it may at an early stage reduce reserve requirements. If it does, the banks will add some of the released reserves to their excess reserves and use some to repay borrowings at the Federal Reserve. Usually, however, the Federal Reserve "leads off" with either decreases in discount rates or open-market purchases, more often the latter. As the Federal Reserve purchases securities, banks add some of the proceeds to their excess reserves and use some to retire their debts to the Reserve banks. During recession

periods, the Federal Reserve often buys enough securities to enable banks to retire practically all their borrowings and to accumulate large excess reserves. As their reserve positions improve, and especially as they receive excess reserves, banks seek to "put the money to work." At first they may buy large amounts of short-term government securities and other open-market assets, thereby depressing short-term interest rates. Gradually, however, interest rates will fall in almost all parts of the market. At some point, usually early, the Federal Reserve will begin to lower discount rates. In a prolonged recession, these are usually decreased several times as market rates decline. After practically all banks are out of debt to the Federal Reserve and most have large excess reserves, further decreases of discount rates may be of little significance except for their effect on expectations, which may also be weak.

MEMBER-BANK FREE RESERVES

The Federal Reserve publishes regularly a statistical series showing the "free reserves" of member banks. It apparently uses these figures as one policy guide and they are also watched closely by financial writers. Free reserves are equal to total member-bank excess reserves minus total outstanding member-bank borrowings from the Federal Reserve. And excess reserves are equal to the volume of reserves actually held by member banks, minus the volume of reserves required against outstanding deposits. Free reserves are obviously positive when excess reserves exceed borrowings and are negative when borrowings exceed excess reserves. Negative free reserves are often called *net borrowed reserves*.

Table 10–2 shows free reserves for selected periods. In June, 1958, and

TABLE 10–2. Free Reserves of All Member Banks for Selected Periods (monthly averages of daily figures; amounts in millions of dollars)

Period	Excess Reserves	Borrowings at Federal Reserve Banks	Free Reserves
December, 1957	577	710	− 133
June, 1958	626	142	484
August, 1959	472	1007	− 535
April, 1963	416	121	295

SOURCE: *Federal Reserve Bulletins.*

April, 1963, excess reserves exceeded borrowings from the Federal Reserve by considerable amounts. However, in December, 1957, and August, 1959, borrowings were considerably larger than excess reserves.

Many believe that the free reserve figure is an excellent index of the amount of existing pressure for expansion or contraction of the supply of money and bank credit. They argue that when excess reserves are much greater than bank borrowings from the Federal Reserve, the banks are under strong pressure to expand and are likely to do so. When their borrowings are much greater than their excess reserves, banks are under strong pressure to contract and are likely to do so. When free reserves are positive but small, the banks are under little or no pressure either to expand or contract.

The free-reserve series does indeed provide useful information about the reserve position of member banks as a group. However, it is highly dangerous to assume that the volume of free reserves is a reliable and unchanging index of pressures for expansion or contraction of bank credit. This single figure has several shortcomings as an indicator:

1. It does not indicate the behavior of the total volume of reserves available to banks. Excess reserves could be increased by decreases of deposits which lower required reserves, and they could be decreased by increases of deposits which raise required reserves.
2. It assumes implicitly that the expansionary effect of a dollar of excess reserves is equal to the contractionary effect of a dollar of outstanding borrowings. Any given amount of free reserves can result from many different combinations of excess reserves and borrowings, and it is not clear that all these combinations will exert the same pressures for expansion or contraction.
3. It ignores the distribution of excess reserves and borrowings among the various classes of member banks. Some classes appear to be more sensitive than others. For example, smaller country banks almost always hold considerable amounts of excess reserves and adjust only sluggishly. On the other hand, big city banks usually hold only small amounts of excess reserves and adjust quickly.
4. It does not take into account changes in member-bank demands for excess reserves, changes in the amount of borrowings at the Federal Reserve that the banks are willing to maintain, and therefore changes in bank demands for free reserves. Bank demands for free reserves are likely to show important cyclical changes.

In prosperity periods when both customers' demands for loans and interest rates are high, member banks are likely to demand only small amounts of excess reserves. They may also be perfectly willing to remain heavily in debt to the Federal Reserve if they can lend at rates profitably above Federal Reserve discount rates. Thus, they demand large negative free reserves. In other words, they may feel under no pressure to reduce the volume of bank credit even if they are relying heavily on net borrowed reserves. The Federal Reserve can change this, however, by raising discount rates sharply relative to market rates.

On the other hand, bank demands for free reserves are likely to rise during recession periods when both demands for bank credit and interest rates are falling. They may demand more excess reserves, both because this costs less with interest rates lower and because some earning assets appear riskier. And they demand a smaller amount of borrowings at the Federal Reserve, especially if market rates of interest have fallen relative to discount rates. Thus, they demand a larger volume of free reserves and will feel under pressure to expand only if the actual amount of free reserves is in excess of the amount they want to hold under existing circumstances.

All this is not to argue that figures relating to free reserves are meaningless or useless. The point is, rather, that by themselves they are inadequate and need to be supplemented by other information, and especially by information about bank demands for free reserves.

TREASURY INSTRUMENTS OF MONETARY MANAGEMENT

The Treasury influences monetary and credit conditions in many ways: through its revenue and expenditure policies, its debt management policies, its policies relative to the size and location of its money balance, and so on. At this point, we shall deal only with its policies relative to the size of its money balance and the distribution of this balance among its three possible forms: Treasury cash in vault, Treasury deposits at the Federal Reserve, and Treasury deposits at commercial banks. Owing to the magnitude of Treasury operations, these policies can have marked effects on monetary and credit conditions, especially over short periods. Ordinarily, the Treasury does not use these powers for deliberate and continuous monetary management; this is the primary responsibility of the Federal Reserve. However, it does try to manage them in such a way as to avoid creating serious problems for the Federal Reserve, and on occasion it uses them deliberately to supplement Federal Reserve policies.

We shall build here upon some of our findings in the preceding chapter, that is, generally speaking, that increases or decreases in the size of the Treasury's money balance tend directly to restrict or liberalize the supply of money and credit to the public. Moreover, shifts of the Treasury balance from deposits at commercial banks to Treasury cash in vault or Treasury deposits at the Federal Reserve tend to reduce member-bank reserves, and shifts in the opposite direction tend to increase member-bank reserves. We shall now see how these actions can be used for restrictive or liberalizing purposes.

Restrictive Actions

Let us deal here with three major cases:

1. The Treasury increases its money balance $1 billion by taxing the public or selling securities to the public. When the Treasury cashes the checks, the public will lose $1 billion of its deposits. If the Treasury holds these deposits at commercial banks, this is the extent of the effect; the reserve positions of the banks are unaffected. But if the Treasury uses the $1 billion to build up its cash in vault or its deposit at the Federal Reserve, member-bank reserves will be reduced by $1 billion.[8]

2. The Treasury increases its balance $1 billion by borrowing from commercial banks. In this case, there is no direct effect on the public's money supply. If the Treasury continues to hold the balance at commercial banks, there is no change in the dollar volume of bank reserves; nevertheless credit conditions tend to be tightened because the banks must hold reserves against the Treasury deposit, and therefore they have fewer reserves to support deposits owed to the public. If the Treasury transfers the deposit to the Federal Reserve or converts it to cash in vault, member-bank reserves will be reduced.

3. The Treasury builds up its money balance by borrowing from the Federal Reserve banks. This action cannot restrict credit. If it holds the increased balance in the form of cash in vault or deposits at the Federal Reserve, there is no effect on either the public's money supply or bank reserves. But if it transfers the funds into a deposit at a commercial bank, the effect is actually to increase member-bank reserves and to ease credit conditions.

In short, we find that an increase in the Treasury's money balance tends to be restrictive unless the Treasury acquires the extra money by borrowing from the Federal Reserve. If it acquires the money balance by taxing the public or selling securities to it, the public's money supply is directly decreased. If it acquires the money by selling securities to commercial banks, the public's money supply is not directly decreased, but the ability of the banks to create deposits for the public is reduced because they must use some of their reserves to support the Treasury deposit. However, given the size of any increase in the Treasury's balance, the degree of restrictiveness depends on the form in which it is held. The effects are least restrictive if the balance is held in the form of deposits at commercial banks, and are most restrictive if it is held as cash in vault or deposits at the Federal Reserve.

[8] We are here neglecting the income effects of tax collections.

Liberalizing Actions

The Treasury can ease monetary conditions by taking actions that are just the reverse of those described above; that is, by decreasing its money balance and by shifting it from the forms of cash in vault or deposits at the Federal Reserve into deposits at commercial banks.

The most liberalizing action that it can take is to draw down its balance in the form of cash in vault or deposits at the Federal Reserve to make payments to the public or to retire debt held by the commercial banks. If it uses these funds to make payments to the public, it increases directly both the public's money supply and commercial-bank reserves. The banks can then expand their loans and security holdings by a multiple of the additional reserves not required to support the initial increase of the public's deposits. If the Treasury uses the funds to retire debt held by commercial banks, the effect is to increase by that amount both the actual and excess reserves of commercial banks.

Less powerful liberalizing actions are those of using Treasury deposits at commercial banks to make payments to the public or to retire Treasury debt held by the commercial banks. If these deposits are transferred to the public, the effect is to increase the public's money supply without changing the banks' reserve positions. If they are used to retire Treasury debt held by the commercial banks, there is no direct effect on either the public's money supply or the dollar volume of bank reserves. However, the reduction of Treasury deposits reduces required reserves and enables the banks to create new deposits by lending or buying securities. If the Treasury uses some of its deposits at commercial banks to retire debt held by the Federal Reserve, the effect is to reduce the dollar volume of bank reserves.

Summary

The Treasury sometimes uses these powers in a positive way to restrict or ease credit to supplement Federal Reserve actions. More often, however, it uses them to avoid creating conditions that would make the job of the Federal Reserve more difficult. For example, it avoids large shifts of its balance among the categories of cash in vault, deposits at the Federal Reserve, and deposits at commercial banks unless the Federal Reserve would welcome the resulting tendency toward ease or restriction. When it has large net tax receipts, it often seeks to minimize restrictive effects by using the funds to retire debt held by the public or the commercial banks, rather than to increase its money balance. And if it does increase its money balance, it holds the extra funds at commercial banks.

SELECTIVE CREDIT CONTROLS

We have emphasized that the purpose of general monetary management is to regulate the total supply of credit and the general level of interest rates; it is not to determine the allocation of this supply among its many possible users and uses. This allocative or rationing function is left to the private market. The monetary managers do not become involved in the complex and controversial question of, "who gets how much for what purposes?" Those who believe in a free-market economy generally favor primary reliance on general monetary management because the allocation of credit helps allocate real resources, and they believe these should be allocated by competition in the market place. However, many persons, including some of those who favor primary reliance on general measures, believe that these should be supplemented by "selective controls"; that is, by measures that would influence the allocation of credit, at least to the point of decreasing the volume of credit used for selected purposes without the necessity of decreasing the supply and raising the cost of credit for all purposes.

Selective controls may take various forms. However, we shall discuss here only the one selective control now wielded by the Federal Reserve and two others that the System has used in the past.

Margin Requirements on Security Loans

The selective control of margin requirements arose out of the Federal Reserve's unhappy experience with stock market speculation in the late 1920s, and especially in 1928 and 1929. There was at that time nothing in the basic economic situation that called for a policy of very tight money. Employment was not over-full, commodity prices were steady, and the objective of promoting recovery and prosperity abroad called for easy money. But the stock market was booming; the rapid rise of prices was supported in part by large increases of loans on stocks. Federal Reserve officials were convinced that this was unsound and that less credit should be available for stock purchases. However, they then had only two methods of dealing with the situation—moral suasion and general credit restriction. They attempted to use moral suasion, exhorting banks not to make loans on stocks while borrowing at the Federal Reserve. This did not work, partly because most of the banks were not in debt to the Federal Reserve, and partly because of the huge and rising volume of nonbank loans on stock. They also invoked general credit restriction, which seemed to dampen business activity more than stock speculation. The outcome is now famous; stock speculation climbed until

the great crash in October, 1929, and the Federal Reserve's policy of general credit restriction came to be blamed in part for the ensuing Great Depression.

It was largely because of this experience that Congress, in 1934, gave the Board of Governors power to fix, and to alter at its discretion, the height of minimum margin requirements on loans for purchasing or carrying securities listed on the national exchanges. Minimum margin requirements are, in effect, minimum required down payments stated as a percentage of the market value of the security; they are the percentage of the value of the security that may not be borrowed or lent upon. To set a minimum-margin requirement is an indirect way of setting a maximum loan value. The latter, in percentage terms, is equal to 100 percent minus the minimum margin requirement. As shown in Table 10–3, the Board of Governors has changed these requirements many

TABLE 10–3. Margin Requirements and Maximum Loan Values

Period	Margin Requirement (percent)	Maximum Loan Value (percent)
Oct. 1, 1934 – Jan. 31, 1936	25–45[a]	55–75[a]
Feb. 1, 1936 – Mar. 31, 1936	25–55[a]	45–75[a]
Apr. 1, 1936 – Oct. 31, 1937	55	45
Nov. 1, 1937 – Feb. 4, 1945	40[b]	60
Feb. 5, 1945 – July 4, 1945	50	50
July 5, 1945 – Jan. 20, 1946	75	25
Jan. 21, 1946 – Jan. 31, 1947	100	0
Feb. 1, 1947 – Mar. 29, 1949	75	25
Mar. 30, 1949 – Jan. 16, 1951	50	50
Jan. 17, 1951 – Feb. 19, 1953	75	25
Feb. 20, 1953 – Jan. 4, 1955	50	50
Jan. 5, 1955 – Apr. 22, 1955	60	40
Apr. 23, 1955 – Jan. 15, 1958	70	30
Jan. 16, 1958 – Aug. 4, 1958	50	50
Aug. 5, 1958 – Oct. 15, 1958	70	30
Oct. 16, 1958 – July 27, 1960	90	10
July 28, 1960 – July 9, 1962	70	30
Effective July 10, 1962	50	50

[a] Maximum loan value was either 75 percent of current market value or 100 percent of lowest price since July 1, 1933, whichever was smaller, but it could always be at least 55 percent of current market value (45 percent after Feb. 1, 1936).

[b] Fifty percent for short sales.

SOURCE: *Federal Reserve Bulletins.*

times, sometimes lowering loan values to discourage borrowing and lending for these purposes and at other times raising loan values to reduce the degree of restriction. On one occasion, in 1946, it raised margin

requirements to 100 percent, thereby preventing any loans for these purposes.

Several aspects of this selective control are worth noting. (1) It applies to borrowers as well as lenders. It is just as illegal for a borrower to borrow in excess of the maximum loan value as it is for a lender to make such loans. Thus, this control limits the demand for such credit as well as limiting the supply for this purpose. (2) It applies not only to member banks but to lenders of every type. Thus, for this purpose, it extended the jurisdiction of the Board of Governors. This precedent was followed in later selective controls. (3) It not only enables the Federal Reserve to restrict the volume of credit used for this purpose without restricting the supply or raising the cost of credit for other purposes, but it may actually ease credit for other purposes. To the extent that less credit is demanded or supplied for this purpose, more tends to be made available for other uses.

Consumer Credit Controls

Selective controls of consumer credit, which were administered under Federal Reserve Regulation W, have had a checkered career. They were first instituted in the autumn of 1941, under an Executive Order, and remained in effect until 1947, when they were withdrawn. They were reinstated in September, 1948, under a temporary authorization by Congress, and expired in June, 1949. After the outbreak in Korea, they were imposed again, but were withdrawn in 1952. Since that time, the Federal Reserve has not been empowered to use this type of control.

This selective control employed two devices: minimum down payments and maximum periods of repayment. Both applied to consumer loans on listed articles. Raising the required down payment (which is, of course, the same as lowering the maximum loan value) tended to reduce the demand for credit for this purpose as well as to reduce the amount that could be legally supplied for it. Shortening the maximum period of repayment, which increased required monthly payments, also tended to reduce the demand for such loans. Only the latter device applied to consumer loans for unlisted purposes.

Real Estate Credit Controls

From 1950 until 1952, as a part of the anti-inflation program initiated after the outbreak in Korea, Congress authorized the Board of Governors to exercise selective control over credit extended to finance new residential construction. This it did under Regulation X. It utilized the same devices as Regulation W: minimum down payments and maximum periods of repayment. Also, like those of Regulation W, its terms were

not uniform for all loans of this general type. Instead, they were designed to favor low-cost housing and housing for veterans. They therefore required higher down payments and shorter periods of repayment for higher-cost housing and on loans to nonveterans.

CONCLUSIONS

Attitudes of economists toward selective credit controls vary widely. Few object to their use in time of war or rapid military mobilization when the government will in any case intervene heavily to determine the allocation of resources and output. At such times, selective credit controls may serve a useful purpose both in diverting resources away from nonessential uses and in inhibiting inflation. But their use in noncrisis peacetime periods is another matter. As might be expected, they are often opposed by those whose business may be reduced by them. Thus, some stock exchange members and officers are not friendly toward margin requirements on security loans, automobile manufacturers and dealers have criticized consumer credit regulations, and the construction industry and real estate dealers opposed restrictions on credit for residential purposes. Many economists have opposed them on various grounds: (1) that they may interfere unduly with the freedom of borrowers and lenders, (2) that they prevent an allocation of resources and output in line with buyers' wishes, (3) that they are unnecessary because general monetary management and fiscal policies are sufficient, (4) that they may come to be looked upon as a substitute for more general and more widely effective measures, and (5) that they are likely to prove unenforceable. This last argument applies primarily to regulations of consumer and real estate credit where the precise value of the asset used as collateral is hard to determine and the number of entities to be regulated is very large.

Other economists contend that selective controls can be a useful supplement to general monetary controls, especially when the misbehavior of credit is limited to only one or a few sectors of the economy. Margin requirements on security loans seem to have served a useful purpose, and similar controls in other areas might also.

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11. The Monetary System: An Over-All View

INTRODUCTION

The purpose of this brief chapter is not to present new materials but to summarize some of our most important findings up to this point, to bring them into focus, and to enable us to visualize more clearly the functioning of the United States monetary system as a whole. More specifically, it will analyze the *direct* determinants of the money supply at any point in time and of its fluctuations through time. Its central interest will be in those types of transactions that directly increase or decrease the public's money supply, but it will give some attention to effects on the reserves of the commercial-banking system.

Several of our earlier findings are essential to this analysis:

1. By the money supply we mean the amount of coin, paper money, and checking deposits owned by the United States "public"; that is, by all individuals and entities of the United States other than the federal government, the Federal Reserve, and the commercial banks.

2. All these types of money are debt money; they are debt claims against their issuers. They may also be called the *monetary liabilities* of the issuing institutions.

3. Only three types of institutions have the power to create debts that serve as money: the Treasury, the Federal Reserve, and the commercial banks.

4. In general, these institutions create and issue monetary liabilities in the process of purchasing assets, and they withdraw and destroy monetary liabilities when they decrease their assets.

THE MONETARY EQUATION

Our analysis will be based upon a consolidated balance sheet for the commercial banks, the Federal Reserve banks, and the monetary operations of the Treasury. Three points should be emphasized: (1) The balance sheet will not include all the many aspects of Treasury operations; it will include only those related to the money supply function, which we shall call the *monetary operations* of the Treasury. (2) The balance sheet is not simply a summation of the three separate sets of balance sheets; it is a partially consolidated balance sheet. Because we are interested primarily in the relation of these institutions to others, we eliminate many of their claims against each other.[1] (3) Though we shall use balance sheet accounting, our central interest is not in the accounting itself, but in identifying and analyzing the factors that determine the size of the money supply at any time and changes in its size through time.

We start with the following fundamental balance-sheet equation:

(1) Assets = liabilities + capital accounts

The asset side of the balance sheet for a stated point in time shows the total value of assets that have been acquired and that are owned by the entities at that time; the other side shows the types and amounts of claims that have been issued to acquire those assets. "Liabilities" represent the value of outstanding debt claims; "capital accounts" or "net worth" represents the value of ownership claims. The two together must be exactly equal to the value of assets. Moreover, these monetary institutions can acquire an increased value of assets during any period only by creating and issuing an equal increase of debt and ownership claims. If they decrease their assets, they must reduce by an equal amount the value of outstanding debt and ownership claims against themselves.

For our purposes, it is necessary to divide total liabilities into two categories: nonmonetary liabilities and monetary liabilities. In nonmonetary liabilities we include all the types of debt liabilities issued by these institutions that are not money. Thus, we may rewrite our fundamental equation as follows:

(2) Assets = monetary liabilities + nonmonetary liabilities + capital accounts

[1] Though it differs from them in several respects, the analysis in this chapter borrows very heavily from both the following: Morris A. Copeland and Daniel H. Brill, "Banking Assets and the Money Supply Since 1929," *Federal Reserve Bulletin*, January, 1948, pp. 24–32 (statistical tables based on this formulation appear monthly in the *Federal Reserve Bulletin*); Edward S. Shaw, *Money, Income, and Monetary Policy*, Chicago, Richard D. Irwin, 1950, chaps. 2 and 3.

This is the same as Equation 1 except that it makes the distinction, essential for our purposes, between debt liabilities that serve as money and those that do not.

By transposing in the above equation, we get the following:

$$\text{(3)} \qquad \text{Monetary liabilities} = \text{assets} - \begin{cases} \text{Nonmonetary liabilities} \\ + \\ \text{Capital accounts} \end{cases}$$

This equation shows that the value of the money supply (monetary liabilities) at any time is equal to the total value of assets held by these institutions, minus the value of their outstanding nonmonetary liabilities and capital or net worth accounts. And through time, the size of the money supply varies directly with the value of these assets and inversely with the value of nonmonetary liabilities and capital accounts.

By listing in Equation 3 the principal types of assets actually held by these institutions and the types of nonmonetary liabilities issued by them, we get Equation 4, which we shall use in the remainder of this chapter.

(4) Monetary Liabilities		Assets	−	Nonmonetary Liabilities + Capital Accounts
Checking deposits + Currency outside banks	=	Monetary gold stock + Treasury currency + Federal Reserve holdings of loans and securities + Commercial bank holdings of loans and securities		Foreign deposits + Time deposits + Treasury holdings of cash and deposits + Capital accounts

Table 11–1 applies this analysis to the situation on April 24, 1963. It shows that the money supply of \$148.4 billion on that date resulted from the acquisition and holding of \$287.8 billion of assets by these monetary institutions, less the \$139.4 billion of outstanding claims against them in the form of nonmonetary liabilities and capital accounts.

ASSETS

To isolate the effects of purchases and sales of assets by these institutions, we shall assume that when they buy assets, they pay for them by issuing coin, paper money, or checking deposits to the public, and that

when they sell assets, they withdraw an equal amount of money from th. public. The cases in which nonmonetary debts and capital accounts are involved will be considered later.

TABLE 11–1. Direct Determinants of the Money Supply, April 24, 1963
(In billions of dollars)

ASSETS		
Monetary gold stock	$ 15.9	
Treasury currency	5.6	
Federal Reserve holdings of loans and securities	31.4	
Commercial bank holdings of loans and securities	234.9	
Total assets		$287.8
Less: NONMONETARY LIABILITIES		
Foreign deposits, net	$ 1.2	
Treasury holdings of cash and deposits	5.5	
Time deposits at commercial banks	103.0	
Total		$109.7
Less: CAPITAL ACCOUNTS[a]		$ 29.7
Equals: MONETARY LIABILITIES		
Demand deposits	$118.2	
Currency and coin outside banks	30.2	
Total		$148.4

[a] Also contains some miscellaneous liabilities and statistical discrepancy.

SOURCE: Derived from data in *Federal Reserve Bulletin*, May, 1963, pp. 656, 661, 662. As used here, the item "capital accounts" is a balancing item. It is simply total assets minus the sum of nonmonetary liabilities and monetary liabilities as shown. This was done to escape the laborious job of accounting for a number of minor items in the balance sheets of the Treasury, the Federal Reserve, and the commercial banks.

Monetary Gold Stock

Gold is an asset of the Treasury. As we found earlier, the Treasury buys gold at $35 an ounce. It usually pays for gold by creating for the Federal Reserve banks an equal amount of gold certificates, receiving in return a deposit credit, and then pays the seller of gold with a check drawn on the Federal Reserve. The seller deposits the check with his bank, which sends it to the Federal Reserve to be added to its reserve account and deducted from the Treasury's deposit account. Thus, the effects of a Treasury purchase of gold are to increase by equal amounts the public's money supply, member-bank reserves, and the gold-certificate reserves of the Federal Reserve banks.

Net sales of gold by the Treasury have the opposite effects. Gold buyers usually pay the Treasury with checks on their banks, thereby giving up deposits. The Treasury retires an equal amount of gold certifi-

cates, and the Federal Reserve deducts an equal amount from the reserves of the bank on which the check is drawn.

Treasury Currency Outstanding

This source of money includes all coins in the United States and paper money issued by the Treasury. Increases of this item tend to increase not only the public's money supply but also the volume of member-bank reserves. Consider two cases: (1) The Treasury issues additional currency to the public when there is no increase in the demand for currency in circulation. The public will return the excess currency to its banks in exchange for increased deposits, and this cash will increase bank reserves. (2) The Treasury issues additional currency equal to an increase in the public's demand for currency. In this case the public has an increase in its money supply in the form of currency, and the banking system is spared the loss of reserves it would have suffered in the absence of the increased Treasury issue.

Federal Reserve Holdings of Loans and Securities

These are obviously assets of the Federal Reserve banks. In general, Federal Reserve purchases of assets tend to increase both the public's money supply and member-bank reserves, and its net sales of assets have the opposite effect. But two cases need to be distinguished:

1. It lends to the public or buys assets from the public. In this case, it pays with checks on itself, the public deposits the checks at banks, and the banks send them along to be added to their reserve accounts.

2. It lends to banks or buys assets from them. In this case the banks receive additional reserves, but there is no direct addition to the public's money supply. However, the increase of Federal Reserve assets has prevented the public's money supply from being decreased by the decrease of commercial-bank assets or by the rise of commercial-bank nonmonetary liabilities in the form of debt to the Federal Reserve.

Net sales of assets by the Federal Reserve tend to have the opposite effects, but here, again, the two cases need to be distinguished. Net sales to the public tend to decrease both the public's money supply and bank reserves. But net sales of assets to commercial banks or net decreases of loans to commercial banks decrease bank reserves without directly decreasing the public's money supply. However, these decreases in Federal Reserve assets offset the increase of commercial-bank assets, or the decrease of commercial-bank nonmonetary liabilities in the form of debt to the Federal Reserve, and prevent them from being reflected in an increase of the public's money supply.

Commercial-Bank Holdings of Loans and Securities

When commercial banks buy assets in the forms of loans and securities, they pay for them by creating deposit credits or by paying out coin and currency, usually the former. When they sell these assets, they decrease their deposit liabilities or withdraw coin and currency from the public, mostly the former.

Summary

We find that the assets in the consolidated balance sheets of the three sets of monetary institutions are of four types: (1) monetary gold stock, (2) Treasury currency, (3) Federal Reserve holdings of loans and securities, and (4) commercial-bank holdings of loans and securities. In purchasing these assets, the monetary institutions tend to issue debt money to the public; and in selling these assets, they tend to withdraw and destroy money formerly held by the public. Increases or decreases in the first three also tend to increase or decrease the dollar volume of member bank reserves.

NONMONETARY LIABILITIES AND CAPITAL ACCOUNTS

The size of the money supply depends not only on the total volume of assets of the monetary institutions, but also on the volume of their nonmonetary liabilities and capital accounts. The nonmonetary liabilities are foreign-deposit claims against the Federal Reserve and commercial banks, Treasury holdings of cash and of deposit claims against the Federal Reserve and commercial banks, and time-deposit claims against commercial banks. The item, capital accounts, is the value of ownership claims against the Federal Reserve and commercial banks. All these claims have the following points in common:

1. They are not a part of the money supply as we have defined it.
2. They are alternatives to, and compete with, monetary liabilities as claims against assets.
3. When considered by themselves, increases or decreases in these claims tend to produce opposite variations in the money supply.

The monetary institutions can acquire assets by issuing nonmonetary liabilities or ownership claims. For example, they may acquire assets by issuing claims to the Treasury, to foreign depositors, to time depositors, or to their owners. In this way, they can secure assets without increasing the supply of money. On the other hand, they may reduce their assets

without decreasing the money supply to the extent that they reduce their other liabilities and ownership claims against themselves.

Moreover, the money supply can be decreased or increased by an exchange of monetary liabilities for other claims, or vice versa. Thus, the public's holdings of money can be reduced as it relinquishes money in exchange for time deposits at commercial banks or to make net payments to the accounts of foreigners or the Treasury. Its holdings of money can be increased if it converts its time deposit claims against commercial banks into monetary claims or receives net payments out of foreign deposits or out of Treasury holdings of cash and deposits.

Summary

The various types of developments that tend directly to increase or decrease the money supply are summarized in the following list:

Factors Tending to Expand the Money Supply	*Factors Tending to Contract the Money Supply*
INCREASES OF ASSETS	DECREASE OF ASSETS
1. Increase of the monetary gold stock	1. Decrease of the monetary gold stock
2. Increase of Treasury currency outstanding	2. Decrease of Treasury currency outstanding
3. Increase of Federal Reserve holdings of loans and securities	3. Decrease of Federal Reserve holdings of loans and securities
4. Increase of commercial-bank holdings of loans and securities	4. Decrease of commercial-bank holdings of loans and securities
DECREASES OF NONMONETARY LIABILITIES	INCREASES OF NONMONETARY LIABILITIES
5. Decrease of foreign deposits	5. Increase of foreign deposits
6. Decrease of Treasury holdings of cash and deposits	6. Increase of Treasury holdings of cash and deposits
7. Decrease of time deposits	7. Increase of time deposits
DECREASE OF CAPITAL ACCOUNTS	INCREASE OF CAPITAL ACCOUNTS

It is important to remember that the first three asset items also appeared in our analysis of "member-bank reserves and related items" as determinants of the dollar volume of member-bank reserves, as did also some of the liability and capital account items.

BEHAVIOR OF THE MONEY SUPPLY

Table 11–2 shows the size of the money supply, and of its various direct determinants, on selected dates beginning with 1929. One is immediately struck by the wide fluctuations of the money supply during this period.

TABLE 11–2. Direct Determinants of the Money Supply
(In billions of dollars)

	June 29, 1929	June 30, 1933	Dec. 30, 1939	Dec. 31, 1945	April 24, 1963
ASSETS					
Monetary gold stock	$ 4.0	$ 4.0	$17.6	$ 20.1	$ 15.9
Treasury currency	2.0	2.3	3.0	4.3	5.6
Federal Reserve holdings of loans and securities	1.3	2.2	2.5	24.4	31.4
Commercial-bank holdings of loans and securities	49.2	30.4	40.7	124.0	234.9
Total	$56.5	$38.9	$63.8	$172.8	$287.8
Less: NONMONETARY LIABILITIES					
Foreign deposits, net	0.4	0.1	1.2	2.1	1.2
Treasury holdings of cash and deposits	0.6	1.1	3.9	27.9	5.5
Time deposits at commercial banks	19.6	10.8	15.3	30.1	103.0
Total	$20.6	$12.0	$20.4	$ 60.1	$109.7
Less: CAPITAL ACCOUNTS	9.8	7.7	7.2	10.3	29.7
Equals: MONETARY LIABILITIES					
Demand deposits	22.5	14.4	29.8	75.9	118.2
Currency and coin outside banks	3.6	4.8	6.4	26.5	30.2
Total	$26.1	$19.2	$36.2	$102.4	$148.4

SOURCE: Computed from data in *Federal Reserve Bulletins.*

From mid-1929 to the low point of the depression in mid-1933, the money supply declined from $26.1 billion to $19.2 billion, or a drop of 26 percent. From that time to the end of 1939, it rose 89 percent. During the defense and war period from the end of 1939 to the end of 1945, it rose $66.2 billion, or 183 percent. From that time to late April, 1963, it rose another $46 billion, or 45 percent. Thus, in April, 1963, the money supply was 4.1 times as large as at the end of 1939, 7.7 times its level at the bottom of the great depression, and 5.7 times its level in mid-1929. The money supply is certainly not a static quantity.

The table also indicates the relative quantitative importance of the various direct determinants of the money supply. By far the most important source of money has been commercial-bank holdings of loans and securities. These did not comprise less than 63.8 percent of total assets in

the consolidated balance sheet on any of the dates shown in Table 11–3, and on most dates, they accounted for an even larger share of the total.

TABLE 11–3. Commercial-Bank Loans and Security Holdings and the Total Assets of the Monetary System

Date	Total Assets in Consolidated Statement (in billions)	Commercial-Bank Holdings of Loans and Securities (in billions)	Commercial-Bank Holdings of Loans and Securities as Percentage of Total Assets
June 29, 1929	$ 56.5	$ 49.2	87.1
June 30, 1933	38.9	30.4	78.1
December 30, 1939	63.8	40.7	63.8
December 31, 1945	172.8	124.0	71.8
April 24, 1963	234.9	287.8	81.6

Moreover, changes in the volume of commercial-bank loans and security holdings were by far the largest single source of changes in the money supply. The other assets should not be neglected. Both the monetary gold stock and Federal Reserve holdings of loans and securities directly contribute significant amounts to the money supply, and their changes contribute directly to changes in the money supply. However, these two items are far less important as *direct* determinants of the money supply than they are as determinants of the volume of bank reserves, which is a major determinant of commercial-bank loans and security holdings. The volume of Treasury currency outstanding is much smaller and fluctuates within narrower limits.

Among the nonmonetary liabilities, which also help determine the behavior of the money supply, time deposits at commercial banks are the largest and show the widest changes. Especially noteworthy is the very large increase of time deposits since the end of World War II, which absorbed nearly $73 billion of the funds supplied by the increase of assets. Much of the increase occurred in the early 1960s after the Federal Reserve raised the ceilings on interest rates that commercial banks may pay on time and savings deposits. The capital accounts of the commercial and Federal Reserve banks show an upward trend, but do not change much in short periods. Changes in foreign deposits and in Treasury holdings of cash and deposits are not major, direct determinants of secular changes in the money supply, but they are sometimes important determinants of short-run changes. For example, the Treasury sometimes tends to add several billions to the public's money supply by drawing

down its own holdings of deposits; at other times, it tends to reduce the money supply by increasing its own holdings of deposits.

The purpose of this chapter has been to summarize all the principal types of transactions that affect directly the size of the money supply. This analysis is important to anyone who wishes to explain the size of the money supply at a point in time and its changes through time. It needs, however, to be supplemented by an analysis of the factors that determine the ability of the monetary institutions to acquire assets and to issue monetary liabilities. For this purpose our earlier study of "member-bank reserves and related items" is essential.

IV. Monetary Theory

12. An Introduction to Monetary Theory

Up to this point our attention has centered on the money supply and the monetary mechanism. We have discussed the nature and functions of money, the composition of the United States money supply, the processes through which the stock of money is increased or decreased, and the powers of the monetary authorities—and especially the Federal Reserve—to regulate the supply of money and credit. These things may be worthy of study simply because some people make a living operating monetary and banking institutions or because they are intriguing examples of man's ingenuity. However, we are interested in them primarily because they are so closely related to other important economic phenomena. What are the relationships among money and monetary policy and such other economic variables as the rate of real income or output, the state of employment and unemployment of labor and other productive factors, the behavior of price levels, and the distribution of income and wealth? To analyze such interrelationships is the central function of monetary theory. Like other branches of economic theory, monetary theory analyzes relationships among economic variables and seeks generalizations or laws of behavior.

MONETARY THEORY AND POLICIES

Rational policy-making involves at least three essential elements:

1. Selection of objectives or ends. This is both difficult and controversial because there are many different objectives toward which monetary actions can be directed, not all of which are likely to be compatible with each other. It is therefore necessary not only to identify the possible

objectives, but also to analyze and evaluate the extent to which they are or can be made compatible, to weigh against each other those that appear to be in conflict, and to make choices.

2. Design and use of instruments to promote the selected objectives. As we have already seen, the principal instruments available to the Federal Reserve are discount operations, open-market operations, and changes of reserve requirements.

3. Theory of relationships among variables. Some theory—implicit or explicit, but preferably explicit—of the relationships among the relevant economic variables, and especially of the relationships between actions that might be taken and the effects that would flow from them, is desirable. By sheer coincidence and rare good luck, a policy-maker might do the thing most conducive to the promotion of his chosen objectives, even if his actions were not guided by an explicit valid theory. But such a happy outcome would indeed be sheer coincidence and rare good luck, unlikely to be often repeated.

Some of the many ways in which theory is inescapably involved in policy-making can be illustrated by an example. Suppose the Federal Reserve has selected as its dominant objectives the simultaneous promotion of continuously high levels of employment and output, the highest sustainable rate of economic growth, stability of price levels, and stability of the exchange rate on the dollar. The Federal Reserve is not empowered to control or regulate directly any of these important variables. Its powers are largely limited to actions relating to discounting, open-market operations, and reserve requirements of the banks. It is immediately involved in important theoretical questions on several levels. If it takes, or fails to take, some specific action, what will be the effects on the stock of money? On the supply of credit? On interest rates? On the behavior of aggregate demand for output? On the responses of employment, real output, money wage rates, and prices?

It would indeed be misleading to claim that either central bankers or economists have developed fully satisfactory answers to these and many other important theoretical questions. Yet, it is clear that rational policy must be guided by some sort of theory. And it is unlikely that policy can for long be better than the theory on which it is based. It is partly for this reason that we shall devote so much attention to monetary theory.

Much of our theory will deal with the effects of money and monetary policy on other economic variables in which we are interested. In effect, we shall ask: How will this specific monetary action affect such things as the aggregate demand for output, employment, real output, interest rates, and prices? How will the results differ from those that would have

prevailed if this action had not been taken or if some other action had been taken? This type of analysis is highly important to the monetary authority, which must be concerned with, and be responsible for, the effects attributable to its own action or inaction.

However, monetary theory has another related but broader function, which is to analyze all the determinants, or at least the most powerful determinants, of the behavior of the economic variables in which we are interested. It is clear that the behavior of such things as employment, output, and prices is determined not by money and monetary policy alone, but also by many other forces. The monetary authority needs to understand these if its policy actions are to be appropriate. Much of monetary policy is of a defensive nature, designed to offset or compensate disturbances from other sources. If the roles of these other determinants of economic behavior are not understood, the monetary authority may not be in a position to prescribe the appropriate compensating or offsetting action. More generally, we need to analyze all important determinants in order to view monetary policy in an over-all context and to assess realistically the role that it can play.

ELEMENTS OF MONETARY THEORY

As will become evident in the remainder of this chapter and in several later chapters, the interrelationships analyzed by monetary theory are both numerous and highly complex. To facilitate exposition, we shall divide these into three groups:

1. Relationships between monetary policy actions and the stock or supply of money.
2. Relationships between the stock of money and aggregate demands for output.
3. Relationships between aggregate demands for output and the behavior of real output, employment, prices, and money wage rates.

It should be constantly remembered, however, that this grouping is an oversimplification in which we indulge only to facilitate exposition, and that there are interrelations among the variables in the three different categories.

We have already discussed at some length the first category, the determinants of the stock of money. We turn now to the second set of questions: the relationships between the stock of money on the one hand and the behavior of aggregate demands for output on the other. This will be explored at length in succeeding chapters, but a few major points will be made here. The stock or supply of money and aggregate demand for output are clearly two different things. The first is simply a stock or quantity at a point in time—the stock of currency plus checking deposits,

The second is a flow over a stated period of time. This is often stated as a rate of expenditures per year. Thus, we may say that expenditures, or aggregate demands for output, were made during a stated period at the rate of $600 billion per year. Even when we state aggregate demand as a demand function representing the various amounts that would be bought at various levels of prices, we are dealing with flows, that is, with amounts purchased per period of time.

Though we shall argue that the size of the stock or supply of money does affect the rate of flow of aggregate demand, only confusion results if the two are equated or if it is assumed that they necessarily change in the same direction and in the same proportion. No one forces the public to spend its stock of money; it could conceivably hoard the entire stock and never spend a penny. Or it could spend its stock of money rapidly in one period and only slowly in the next. To establish the relationship between the size of the stock of money and the flow of expenditures, we have to introduce the concept of income velocity: the average number of times each dollar of the stock of money is spent for output each year. This is determined by the decisions of the public, for each recipient of money is free to hold it for short or long periods or to spend it quickly or only after a long delay. Thus, to understand the relationship between the size of the stock of money and the flow of demand for output, we must analyze the decisions of the public relative to the holding and spending of money. This will be done later at considerable length.

At this point, we shall merely assert what will be argued later. A stock or supply of money in excess of the amounts that the public wishes to hold under existing conditions will increase demand functions for other things. In an effort to get rid of the excess money balances, the public will shift to the right its demand functions for other things that it might consume or hold. Its flow of expenditures will increase. For example, suppose that, starting from a condition of equilibrium, the stock of money is increased while the public's demand function for money balances remains unchanged. The supply of money will now exceed the quantity of money balances demanded under existing conditions, and the public will try to spend away the excess supply by increasing its demands for other things.

On the other hand, suppose that the supply or stock of money is deficient relative to the amounts that the public demands to hold under existing conditions. Members of the public will try to repair the deficiency—to bring their actual balances up to the desired levels by decreasing their demands for other things. In other words, each will decrease his expenditures in an effort to build his balances to the demanded level.

This, in brief outline, is an introduction to the type of theory that we shall develop later to relate the supply of money and the demand for money balances to the flow of demands for output.

We now turn to the third part of monetary theory, which will occupy our attention in the remainder of this chapter: relationships between aggregate demands for output and the behavior of real output, employment, prices, and money wage rates. We shall deal with only one aspect of this problem, the response of the economy to shifts of aggregate demand for output. Suppose that the aggregate demand function for output increases or decreases by some specified amount. To what extent will this be reflected in price changes? In changes in money wage rates? In the rate of real output? In the level of employment? Such questions relating to the response patterns of the economy force us to consider the organization and operation of markets for both output and labor, including types and degrees of competition and monopoly, policies of such monopolies as may exist, labor union objectives, and so on. The outcome depends on these and many other conditions.

DEMAND AND SUPPLY

As the next step toward understanding the responses of output, employment, and prices to demand conditions and to changes in demand conditions, it will be useful to recall some aspects of general economic theory relating to the output, sales, and prices of a particular commodity, such as copper. Theory tells us that these factors are all determined simultaneously by demand and supply conditions. Suppose, for example, that the demand and supply conditions for this commodity are represented by the demand function *DD* and the supply function *SS* in Fig. 12–1. Price (denoted by P) is measured along the vertical axis. The quantities demanded and supplied per period of time, such as per year, are measured along the horizontal axis and designated by Q. We find that as long as demand and supply conditions for this commodity continue to be those represented by the *DD* and *SS* curves, the market for this commodity can be in equilibrium only if the quantities actually supplied and demanded are at Q_0 and the price is P_0. Only this combination of P and Q will exactly clear the market, leaving no excess supply or excess demand.

This example illustrates at least two simple points that will be useful for our later analysis. First, market equilibrium is not determined by demand conditions alone, or by supply conditions alone, but by both together. Second, both price and the actual rate of output and sales are

determined simultaneously. Thus, demand and supply conditions together determine price, rate of real output and sales, and the total money value of output and sales, P_0Q_0. If we knew more about the production functions of the industry (the amounts of the various types of inputs required to produce the various rates of output), we could also determine the quantities of productive factors employed in producing the commodity at the equilibrium rate of output Q_0.

This type of analysis is often referred to as *statics*, it deals with those equilibrium, or "balance," conditions that tend to be established and

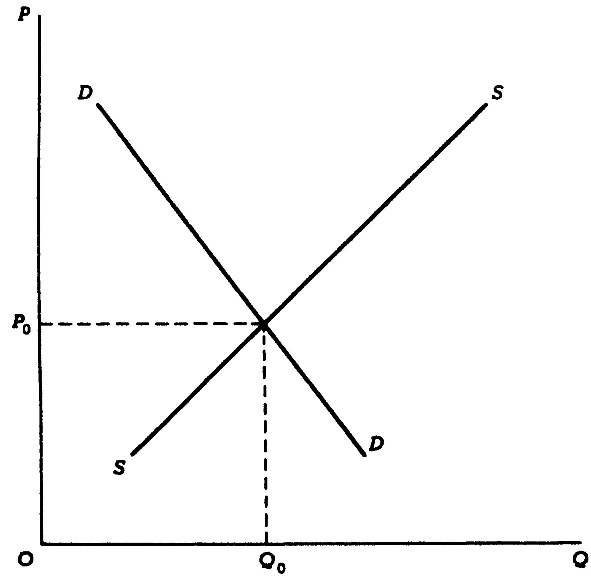

FIG. 12–1. Demand for, and Supply of, a Commodity.

maintained, with static demand and supply conditions reflected in given demand and supply functions. Since we shall at times use this type of analysis, two of its characteristics should be noted: (1) Its attention is centered on equilibrium conditions; it deals with disequilibrium conditions only to show that they are unstable and cannot be maintained, and (2) it has no time dimension; it does not indicate the length of time required to achieve or to restore equilibrium. Because of miscalculation or for other reasons, price-quantity relationships can obviously depart from those of equilibrium. Yet static analysis specifies neither the time required to restore equilibrium nor the time path followed by prices and quantities before they again reach equilibrium.

The type of analysis called comparative statics compares two sets of

equilibrium conditions: those existing before and after a shift of a demand or supply function. It attempts to answer this question: How will equilibrium be changed if the demand function or the supply function shifts in a specified way? For example, we have already noted that price will remain at P_0 and actual real sales at Q_0 as long as demand and supply conditions continue to be those represented by the *DD* and *SS* curves. Suppose now that, for some reason, the demand function increases from *DD* to D_1D_1. That is, the community demands more of the commodity at each price or will pay a higher price for each quantity. This increase of the demand function will tend to raise the price, to increase the quantities actually supplied and purchased, or to raise both prices and quantities produced and sold. The actual effects of any given increase of

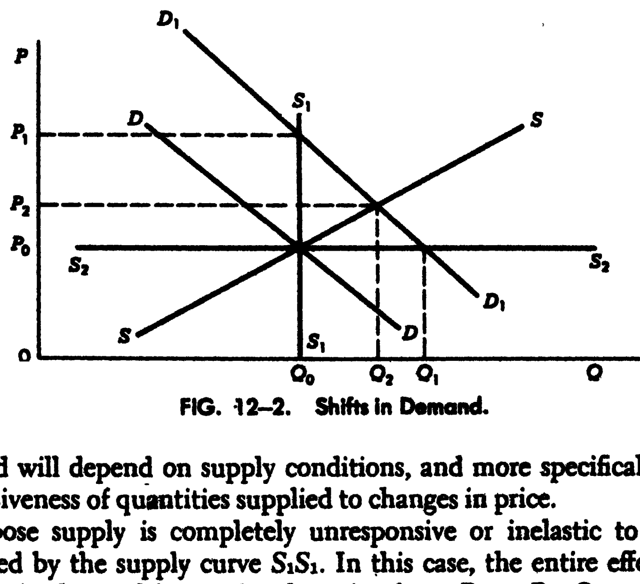

FIG. 12–2. Shifts in Demand.

demand will depend on supply conditions, and more specifically on the responsiveness of quantities supplied to changes in price.

Suppose supply is completely unresponsive or inelastic to price, as indicated by the supply curve S_1S_1. In this case, the entire effect of the increase in demand is to raise the price from P_0 to P_1. Quantities produced and sold and the quantities of productive factors employed in producing the commodity remain unchanged. Suppose, to go to the other extreme, that supply is completely responsive or elastic to price, as indicated by the supply function S_2S_2. That is, suppliers stand ready to supply at price P_0 any quantity that may be demanded, but none at a lower price. In this case, the increase of demand will not raise price at all; its entire effect will be to increase quantities produced and sold and to increase the quantity of productive factors employed in producing the commodity. Usually, the responsiveness of supply to price will lie

somewhere between these extremes. This is illustrated by the supply function SS. In these situations, an increase of demand will increase price, quantities actually produced and sold, and the quantities of productive factors employed in producing the good. The more responsive supply is to price, the less will a given increase of demand raise price, and the more will it increase quantities.

The reader will find it useful to trace out the effects of a decrease of demand, such as a shift from D_1D_1 to DD, noting the relevance of the responsiveness of supply to the effects on price and output. He may also wish to trace through the effects of a decrease of supply, by which we mean a decrease in the quantity supplied at each price, and of an increase in supply, by which we mean an increase in the quantity supplied at each price.

In the remainder of this chapter, we shall adapt this type of analysis, which was originally developed to explain the prices and output of individual commodities, to the economy as a whole. Our supply function will relate to the economy's aggregate output of goods and services, and our demand function will relate to the quantities of that output demanded at various levels of prices. However, as we adapt this kind of analysis, we shall have to alter certain assumptions relating to demand and supply functions and their relationships to each other.

In the first place, the responsiveness of supply to changes in demand and price is likely to be greater for an individual commodity than for the total output of the economy. Consider first the case of an individual commodity, such as copper, cotton shirts, or rice, which constitutes only a small part of total output and employs only a small fraction of the total labor force and other inputs. Suppose now that, starting from equilibrium conditions, the demand for the commodity rises. The first response may be to expand output by re-employing labor, capital, and other productive factors already committed to that industry. Output of the commodity can be expanded still further by drawing labor, materials, and other factors away from other industries. If this industry employs only a small fraction of the productive factors in the economy, it may be able to hire many more at no more than a modest increase in cost and to expand output greatly with only a small increase in price.

Contrast with this the responsiveness of the supply of total output. Suppose that the aggregate demand function for total output increases. Business firms can indeed respond by using unemployed labor and unutilized capacity to expand output. But they obviously cannot expand total output further by drawing labor and other productive factors away from each other. As full employment of labor and existing capacity is

approached, the responsiveness of output to demand and price necessarily becomes very low, and further increases of demand must necessarily be reflected largely in prices. What is possible for each industry singly is impossible for all together.

In the second place, it is dangerous to assume that shifts in the aggregate demand function for total output will leave the supply function of total output unchanged. Such assumptions are usually permissible in the case of a particular commodity. Suppose, for example, that the demand function increases for a commodity that constitutes only a small fraction of total output and whose production requires only a very small fraction of the labor force and other productive factors. The rise of demand for this commodity will indeed increase this industry's demand for labor and other factors. But the rise of this demand may increase the total demand for factors so little as to have little effect on the general levels of money wage rates and the prices of other inputs that enter into costs of production.

Increases of the demand function for total output may have quite different effects. From branches of economic theory dealing with the pricing of inputs and the functional distribution of income, we learn that demand functions for labor and other inputs are derived demands; that is, demands derived from the value of the outputs produced by those factors. Firms hire or buy inputs only because they can produce output, and the amounts of inputs they will buy and the prices they will pay depend on the amounts the factors can add to the value of output. The outcome is that firms will hire all those inputs whose marginal additions to the value of output are greater than their marginal costs, and will leave unemployed those inputs whose additions to the value of output are less than their marginal costs.

Suppose that, starting from an equilibrium situation, there is a sharp increase in the demand function for total output and that this tends to raise the prices of output. This increase in the money value of output will raise the marginal value product of labor and other inputs and increase demand functions for these inputs. The result is likely to be increases of money wage rates and the prices of other inputs. Thus, the rise of demand for output indirectly raises wage rates and other elements of cost. Increases of prices, wage rates, and costs of production can be so interrelated as to make it almost impossible to disentangle causal relationships. To some it may appear that price increases were caused by rising costs of production; others proclaim that increases in costs were induced by rising prices for output, which in turn were induced by excessive demands for output.

In a comparable way, decreases of the demand function for output decrease demand functions for labor and other inputs. If wages and the prices of other inputs are flexible downward, cost levels will also fall. But if money wage rates and prices of other inputs will not fall, a given decrease of demand for output may be reflected fully in decreased employment of inputs.

These are only a few examples of the interrelations of aggregate demand and supply functions. More will be encountered later.

STATICS, COMPARATIVE STATICS, AND DYNAMICS

As noted earlier, we shall rely largely on types of economic analysis known as statics and comparative statics. Two characteristics of these types of analysis should be kept in mind. First, they concentrate on equilibrium conditions. Second, they do not explicitly take time into account. They do not indicate the length of time required to reach equilibrium, or the time required to move from one set of equilibrium conditions to another, or the time path followed by variables in their journey toward equilibrium.

Another type of analysis, which we shall use very little, is called *economic dynamics*. As one writer defines it, "Economic dynamics is the study of economic phenomena in relation to preceding and succeeding events."[1] Dynamic analysis explicitly takes time into account, analyzes the process of change, and attempts to trace out the time path followed by variables. The conclusions yielded by dynamic analysis can differ from those of statics and comparative statics, but they need not. In many cases, these types of analysis supplement each other.

One type of relationship between comparative statics and dynamics can be illustrated by returning to the case already considered (see Fig. 12–2) in which the demand function for a particular commodity increased from DD to D_1D_1, with the constant long-run supply function SS. Comparative statics indicates that the effects of the increase of demand are to raise price from P_0 to P_2, and the quantities produced and sold, from Q_0 to Q_2. However, it would be too much to expect that the adjustment will occur instantaneously or even that prices and quantities will move steadily toward the new equilibrium point. To increase quantities supplied may require time. In the first period, the quantity supplied may not increase at all, so that price rises above P_2 to P_1. But this high price will attract additional production, and as quantities supplied increase from period to period, the price will fall. Producers may even overshoot the mark and increase quantities so much as to drive price below P_2.

[1] W. J. Baumol, *Economic Dynamics*, 2nd ed., New York, Macmillan, 1959, p. 4.

Only later, as excess production disappears, may prices rise back toward P_2. Thus, the time required for the adjustment may be short or long, and the time path followed by the variables may be highly complex.

Ideally, we should make liberal use of dynamics as well as statics and comparative statics in our monetary theory. For one thing, time is important in monetary policy. It is not enough to know what the final effects of the monetary action will be; we would also like to know the amount of time required to achieve those effects and the time path of the responses. Moreover, monetary policy must deal with disequilibrium conditions and disequilibrating processes, such as business cycles. Our very limited use of dynamics is only because this type of analysis is so difficult and requires a liberal use of mathematics, and because our knowledge of dynamic processes is so meager.

The succeeding sections have only one limited purpose: to illustrate with a few simple models some patterns of response of output, employment, and price levels to autonomous shifts of the aggregate demand function for output.

SHIFTS OF DEMAND WITH OUTPUT COMPLETELY UNRESPONSIVE

It will be convenient to begin our analysis of real output, prices, and employment with the relatively simple case in which the rate of output is completely unresponsive to the average level of prices. That is, the same output is produced and offered for sale regardless of the average price level. We shall assume further that this output is one at which the economy is operating at full capacity, with all productive factors employed. In the upper graph in Fig. 12–3, we measure the rate of real output, O, on the horizontal axis. Real output is measured at annual rates; it is the rate of production of real goods and services per year.[2] The

[2] In what unit is this real output measured? The usual physical measures, such as pounds, tons, gallons, barrels, dozens, or units, are unacceptable for aggregating diverse types of output such as coal, petroleum, and eggs. For one thing, the choice of units is quite arbitrary; we could measure coal in pounds or bushels as meaningfully as in tons. Moreover, physical measurements of different commodities have little or no economic meaning. For example, a ton of gravel is usually not considered economically equivalent to a ton of rubies. For such reasons, our unit for measuring real output is that amount of each commodity that sold for \$1.00 in some selected base period. For example, if the price of coal in the base period was \$20 a ton, our unit of measurement is 1/20 of a ton of coal. If the price of wheat was \$3.00 a bushel, our unit is 1/3 of a bushel of wheat, and so on. Our reason for using this unit is that quantities of the various commodities that in the base period sold for the same price must in some sense have been considered economically equivalent to each other, at least in that period. These quantities change, of course, as the relative prices of the commodities change. Since we measure real output in units of one dollar's worth in the base period, P, the average price per unit of output at any given time is the average number of dollars required to buy the quantity of output that \$1.00 bought in the base period.

rate of output O_F is assumed to be full capacity; higher rates are unachievable with the available technology and supplies of productive factors. P is the average price per unit of output. SS is the supply curve of output, which we assume to be at the full capacity of the economy and completely unresponsive or inelastic to P. DD is the demand schedule for output, showing the amounts that would be demanded at the various possible levels of P.

The lower graph of Fig. 12–3 indicates the supply of labor and the

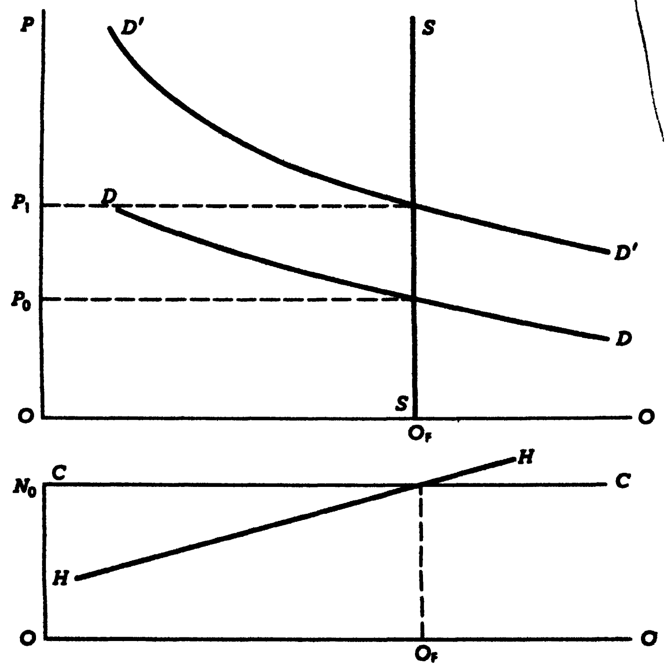

FIG. 12–3. Unresponsive Supply and Shifts in Demand.

demand for labor in relation to the rate of real output. On the vertical axis, we measure the quantity of labor supplied and demanded, this being measured in man-hours and denoted by N. The curve CC represents the supply of labor available for hire. The curve HH represents the demand for labor for use in production, this demand being assumed to depend on the rate of output. Since labor is hired for production, the amount demanded depends on the rate of output.[8] Full employment

[8] The quantity of labor demanded, as measured in man-hours, is equal to the rate of output, O, divided by the average output per man-hour worked. It will be recognized that our analysis of the relationship of the demand for labor to the rate of output is over-

exists only at that level of output at which the demand for labor is equal to the available supply: at the intersection of the *CC* and *HH* curves. The amount of unemployment at each lower level of output is measured by the vertical distance between the *CC* and *HH* curves at that level of output.

Under the conditions illustrated in Fig. 12–3, O will be at capacity levels and full employment will prevail regardless of the height of the aggregate demand function. Such conditions might result from purely competitive conditions in both output and labor markets with prices and money wage rates fully flexible both upward and downward. Under pure competition, no producer has the power to influence the price of his product, and he adjusts by producing as much as he can without incurring marginal costs in excess of the price he receives for his product. A major part of his marginal cost is the cost of labor. We assume here that workers have no "money illusion." That is, their supply curve of labor depends not on the money wage rate but on the real wage rate, or (money wage rate)/(price of output). Thus, proportional changes in money wages and prices leave the labor supply function unchanged. If unemployment occurs, money wage rates will fall, and this will lower the marginal costs of output. And in purely competitive output markets, the fall of marginal costs will be matched by a fall of prices. In such a model, the assumptions of pure competition, lack of money illusion, and flexibility of prices and money wage rates, both upward and downward, are crucial.

If the aggregate demand function for output is that represented by *DD*, the average price of output will be P_0. The aggregate money value of output, or national money income, will be equal to real output multiplied by its average price per unit, or P_0O_F.

Increase in Demand for Output

Suppose now that, because of an increase in the money supply or for some other reason, the demand for output doubles in the sense that the community becomes willing to pay twice as much for each rate of output. This is indicated by the shift of the demand curve from *DD* to *D′D′* (Fig. 12–3). If the quantity of output available for purchase remains constant, the effect must be to double the price level of output,

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simplified. For example, the quantity of labor used per unit of output may change with changes in the price of labor relative to the prices of other productive factors. Moreover, there may not be a straightline relationship between output and the employment of labor because of economies or "diseconomies" of scale. In the stage of increasing returns, output increases more than in proportion to the labor used; in the stage of decreasing returns, the quantity of labor used rises more than in proportion to output.

raising it from P_0 to P_1. The total money value of output must also double, rising from P_0O_F to P_1O_F.

We may be sure that such a rise in the demand for output and such an increase in the price of output will lead to an increase in money wage rates and in the prices paid for the use of other productive factors, for the demand for these factors is based on the money value of their output. The rise of money wages may occur quickly or slowly, but it will occur as employers, enjoying a marked increase in the prices of their output, bid against each other for labor and other productive factors. If these rises occur very rapidly and parallel closely the rise in the prices of output, the community may engage in bitter arguments as to whether the increase in prices caused the rise of costs, or vice versa. In the present example, both resulted from the rise of demand, which might have been induced by an increase in the supply of money.

This phenomenon of rising prices with no change in real output or real income may be called *pure price inflation*. Such an inflation cannot harm everybody in the community, for the total real income or output available for sharing remains unchanged, and the stock of real wealth in the form of land, buildings, equipment, and other improvements is not diminished. But pure price inflation can bring about important shifts in the distribution of real income and wealth. When the price level doubles, all those whose money incomes fail to double suffer a decrease in their real purchasing power over income goods. Those whose money incomes remain constant lose half of their real incomes. Many types of money income are of this type: interest on debt holdings, building or land rentals fixed by long-term contracts, and pensions and annuities. Some other types of money income may rise, but less than in proportion to the rise of prices. Among these are likely to be salaries of government employees, teachers, and employees of religious and charitable institutions. On the other hand, those whose money incomes rise more than in proportion to price increases gain real income. Among these are likely to be recipients of business profits and highly volatile types of wages.

It is difficult to generalize about the behavior of money wage rates in periods of pure price inflation. In some periods they have lagged seriously behind the rise of prices, so that real wages fell during the period of the lag. More recently, however, labor has found ways of reducing or eliminating the lag; it has used escalator clauses and other devices to increase wages as fast as prices rise. Nevertheless, some types of wages and salaries still lag.

Pure price inflation also redistributes real wealth. Those types of assets whose prices rise less than in proportion to the general level of prices

lose real purchasing power. Those whose prices remain constant lose half their purchasing power when the price level doubles. Among these are money itself; savings accounts; mortgages, bonds, and other debt obligations; and accrued values of annuities and life insurance policies. Huge amounts of wealth are held in these forms and are subject to erosion by inflation. On the other hand, some assets enjoy price increases more than in proportion to the increase in the price level and thereby increase in real purchasing power. Among these are likely to be ownership claims against real estate, commodities, and business firms.

Price inflation is a potent means of transferring real wealth from creditors to debtors. For example, suppose that at some point in time Riley buys a house for $20,000 and pays for it with $10,000 of his own money and an equal amount borrowed from McGrath on a mortgage. Suppose now that the price level doubles and that the money value of the house rises to $40,000. McGrath still has his $10,000 mortgage claim, but it will buy only as much as $5000 would have bought at the time the loan was made. Riley, on the other hand, now has an equity claim against the house of $30,000, which will buy as much as $15,000 would have bought when he purchased the house. In effect, inflation transferred from McGrath to Riley an amount of purchasing power equal to $5000 at the time of the loan. It is no cause for wonder that creditors and debtors have different attitudes toward inflation.

Large and persistent price inflation that gives rise to expectations of still further price increases may seriously reduce real output. Farmers may refuse to sell their products for money. Business firms may find it more profitable to hoard inventories than to process materials and sell them. The community may refuse to save or to make its savings available in exchange for debt obligations. Production may be interrupted by bitter labor strife.

Hyperinflation, such as that in Germany after World War I, may endanger the very survival of the existing social and economic system. It may virtually eliminate the economic power of those with fixed money incomes and fixed money wealth, create widespread feelings of injustice and discontent, and pave the way for extremist radical groups, such as fascists or communists.

Decrease in Demand for Output

Let us now consider the opposite case in which, because of a decrease in the money supply or for some other reason, the demand for output decreases while the supply of output is completely unresponsive and unchanged. More specifically, let us assume that demand falls by half, in

the sense that the community will pay only half as high a price for each amount of output. This may be represented in Fig. 12-3 by a shift of the demand curve from $D'D'$ to DD. The price level of output will fall by half, declining from P_1 to P_0, and the money value of output or national money income will decline, falling from P_1O_F to P_0O_F.

These are the necessary results of a decrease of the demand for output when the supply of output is completely unresponsive to price. But, is it realistic to assume that the supply of output is completely unresponsive to price? It clearly is not if either money wage rates and the prices of other productive factors or the prices of output are "sticky" and not freely flexible downward; nor is it if workers accept unemployment rather than take decreased money wage rates or if producers reduce output rather than lower their prices enough to sell a capacity level of output. But it may be realistic if both the prices of productive factors and the prices of output are freely flexible downward. Suppose, for example, that at the first threat of unemployment, workers accept lower money wage rates rather than run the risk of losing their jobs. This lowers the cost schedules of producers and enables them to lower their prices without squeezing their profit margins. Suppose that they lower their prices to the extent necessary to sell their output at capacity levels. In this event, the effect of a decrease in the demand for output might be to lower the prices of output without lowering real output or employment. This is a case of "pure price deflation." We do not claim that in actuality the prices of productive factors and output are freely flexible downward or that the supply of output is completely unresponsive to declines in its price. Rather we cite this possibility to emphasize the importance of supply responses in determining the economic effects of any given decrease in the demand for output.

Pure price deflation cannot harm all members of the community, for, by definition, it does not decrease the total real output to be shared or the total stock of real wealth. However, it can effect important shifts in the distribution of real income and wealth. In general, these effects are the reverse of those resulting from pure price inflation. The reader may find it useful to note which types of income and assets gain real purchasing power and which types lose.

SHIFTS OF DEMAND WITH OUTPUT RESPONSIVE

Let us now contrast the economic effects of shifts in the demand for output when the supply of output is not completely unresponsive to price but rises somewhat as prices rise. It must, of course, become un-

responsive when capacity-level output is reached. The curve *SS* in Fig. 12–4 represents such a price-responsive supply curve of output. It is essentially a relatively short-run supply function, assuming that the state of technology and the supply of productive factors change little, if at all. It also assumes that the level of money wage rates and the prices of other productive factors have been determined by past events, that they do not decline even in the face of unemployment, and that they do not

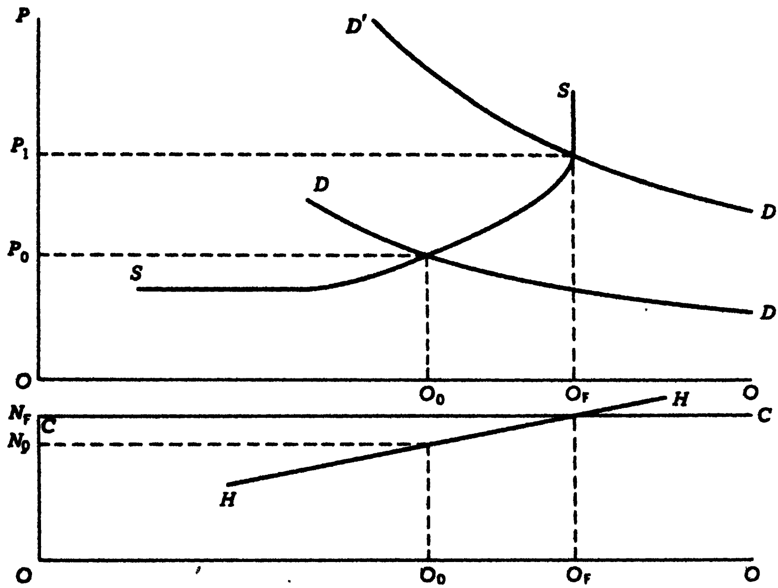

FIG. 12–4. Responsive Supply and Shifts in Demand.

rise before capacity output and "full employment" are reached. Note that in this model, shifts of the demand function for output do not shift the supply function of output.

Suppose that while the supply conditions of output are those represented by *SS*, the demand function for output is *DD*. The equilibrium combination will be rate of output O_0, price level of output P_0, and money value of output or national money income P_0O_0. At any higher rate of output and prices, the supply of output would exceed the demand for it and some would remain unsold, thereby tending to lower prices and discourage production. At any lower rate of output and prices, the demand for output would exceed the available supply, which would tend to raise prices and encourage production. In this case, the economy is

producing far below its capacity level; O_0 is far short of O_F. The amount of unemployed labor is indicated by the vertical distance between the CC curve, the supply of labor, at the rate of output O_0. We may safely assume that when so much labor is unemployed, there will also be a large excess capacity in mines, factories, and merchandising establishments.

Increase of Demand for Output

Suppose now that the demand for output rises from *DD* to *D'D'*. The effects will be to raise real output from O_0 to O_F, the price level of output from P_0 to P_1, the money value of output from P_0O_0 to P_1O_F, and the amount of employment from N_0 to N_F. It will be noted that in this case, the rise of demand elicited large increases in real output and employment. This is reasonable to expect when the rise of demand starts from a situation of widespread excess capacity and unemployment. The existence of large numbers of unemployed workers inhibits wage increases that would raise the cost structures of producers. With large excess capacity, producers are usually able to increase output without encountering seriously increasing marginal costs. In any case, the existence of large amounts of unused capacity discourages price increases for output. In such situations, producers may respond to increases of demand largely by offering more employment and by expanding output and to only a small extent by raising the prices of their output. But further increases of demand as capacity levels of output are approached may be reflected less and less in increased output and employment and more and more in price increases. One industry after another becomes a "bottleneck" and encounters sharply increasing costs per unit of output, more and more firms come to operate in the range of sharply rising marginal costs, and in general the bargaining power of sellers rises relative to that of buyers. Further rises of demand after full employment is reached bring the economy into a state of pure price inflation.

This situation presents important lessons for monetary and fiscal policy-makers. Increases in the money demand for output that are reflected in pure price inflation with no increase in output may be highly undesirable because of their effects on the distribution of wealth and income. But increases of demand at times of unemployment and underutilization of productive capacity may elicit large increases in the nation's real output. And some increase in the prices of output may be necessary to achieve these increases in output. In trying to manipulate demand to achieve "maximum employment and output without inflation," monetary and fiscal authorities face the difficult task of fore-

casting the effects of any given change in demand on output and prices, and of determining the degree of responsiveness of output to price changes.

Decrease of Demand for Output

Let us now consider the reverse case, in which the demand for output falls and the supply of output is responsive to price. This may be represented as in Fig. 12–4 by the decline of demand from *D'D'* to *DD*. We see that the effects are to lower real output, employment, the price level of output, and the money value of output. In some cases, decreases are reflected largely in declines in output and employment and to only a small extent in reduced prices. This is to be expected when cost and price structures are inflexible downward. Workers or their bargaining agents may successfully resist decreases in money wage rates even if several million are unemployed. This prevents, or at least inhibits, downward shifts in producers' cost schedules.[4] Because of the rigidity of their costs, or for other reasons, producers may respond to decreases in the demand for their products by reducing their output as well as their prices, or even by reducing output while keeping prices unchanged. In highly competitive industries where no one seller has any significant control of the price of his product, a decline of the market price may lead producers to abandon large amounts of output whose marginal costs come to be in excess of the lowered market price. Producers in industries characterized by monopoly power often believe that the demand for their product is so inelastic to price decreases that they will be better off if they maintain their prices and allow the decrease of demand to be reflected in reduced sales. It has often been observed that, in administered price industries, decreases in demand are reflected much more in decreased output than in reduced prices. But prices actually paid usually decline more than published or list prices; some "price chiseling" is likely to break out under such conditions.

We noted earlier that a decrease of the demand for output that is reflected in pure price deflation with no change in real output or employment may be highly undesirable because of its effects on the distribution of income and wealth. But a decrease of demand that markedly lowers real output (or income) and employment may be much worse. Such price declines as do occur tend to shift income and wealth because of

[4] Note that we do not say that, in practice, employment and output would be sustained if wage rates were reduced. For one thing, a reduction of wage rates may, by lowering the money incomes of workers, decrease the demand for output still more. Moreover, an initial decline of wage rates and prices may create expectations of still further decreases in the future and lead purchasers to postpone their buying.

the changed purchasing power of the dollar. But many people may be hurt less by the shrinkage of their percentage share of the national income than by the shrinkage of the income pie available for sharing. We need not dwell on the plight of those, such as the unemployed or businessmen making only losses, who receive only a shrunken share, or no share at all, of a shrunken, real national income. Large decreases of aggregate demands for output in the face of money wage rates and prices that are inflexible downward can be a national catastrophe.

CHANGES IN DEMAND THAT SHIFT THE SUPPLY CURVE OF OUTPUT

In the preceding section, we assumed that shifts in the demand for output left the supply curve unchanged. This may be a fairly realistic assumption when wage rates and the prices of other productive factors are rigid and the economy is operating considerably below full employment levels both before and after the shift of demand. Let us now consider the case in which a shift of demand for output shifts the supply curve of output by bringing about changes in money wage rates and the prices of other inputs that enter into cost structures.

In Fig. 12–5, the initial demand for output is represented by *DD*, and the initial supply curve of output by *SS*. Output and employment are at virtually full-employment levels. Suppose now that the demand for output doubles, as indicated by the upward shift of demand from *DD* to *D′D′*. Since output cannot be increased, the price level of output will also double. Starting from a full-employment situation, such a rise of demand and prices will almost certainly tend to raise money wage rates and the prices of other productive factors. Since every increase in the price level of output constitutes an increase in the marginal value product of labor and other productive factors, employers will try to hire more labor and will compete with each other for the available supplies. The bargaining power of labor is increased; workers will point to the rising profits of business and to increases in the cost of living, and will argue that the rising prices of output enable firms to pay higher wages. Money wage rates are not inflexible upward, especially not when unemployment is at low levels. Let us suppose that money wage rates and the prices of other inputs also double, thereby raising producers' cost schedules. Thus, the rise of the aggregate demand function from *DD* to *D′D′* has shifted the supply function from *SS* to *S′S′*. This is a decrease of the supply function; any given amount of output will now be produced only at a price twice as high as before. Employers may indeed have enjoyed extraordinary profits during the process of price inflation. But, when all

adjustments have occurred, including the rise of cost levels, their real profits (their money profits adjusted for changes in the purchasing power of each dollar) may be little if any better than before.

Suppose now that the demand function for output falls back to its initial position *DD*. Originally this demand function produced full employment and the price level P_0. It might again if money wage rates, prices of other inputs, and prices of output were perfectly flexible downward. But, if they are inflexible downward, and cost structures remain

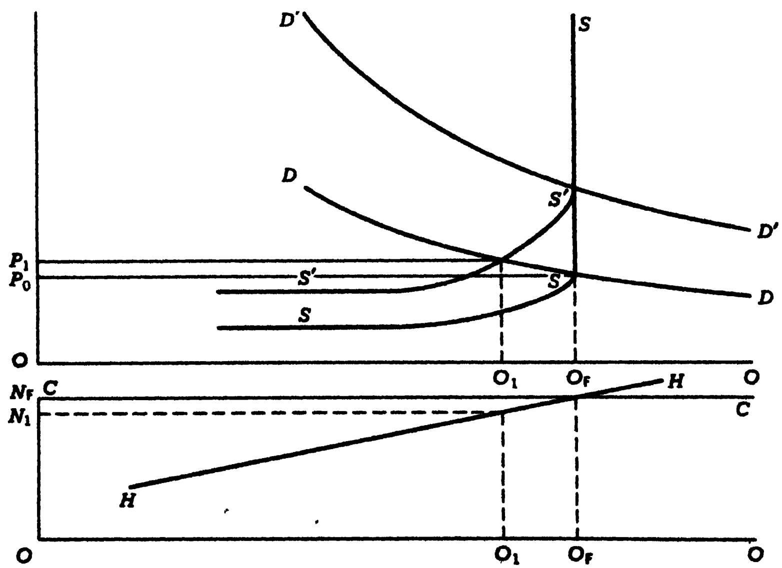

FIG. 12–5. Shifts of Supply by Shifts of Demand.

high, the supply function will not fall back to *SS* and demand function *DD* will be accompanied by a higher price level *P* and a rate of output considerably below full-employment levels.

This example contains an important lesson for policy-makers in periods following price and cost inflation. They may regret the inflation and the injustices and disturbances accompanying it, and be tempted to lower prices toward some level that prevailed earlier. However, they can lower prices only by lowering demand for output. If wage, cost, and price structures are inflexible downward, such decreases of demand may not succeed in lowering price levels significantly, or they may succeed only after a long period of unemployment and underproduction.

In nations whose wage and price structures are inflexible downward,

prices are likely to have an upward "ratchet effect." Prices may rise in some periods, but they are not allowed to slip back to their earlier, lower levels because the community is not willing to pay the necessary price in terms of unemployment and loss of output. Deflation is an inappropriate remedy for inflation because it brings its own cost and injustices. The effects of inflation plus the effects of a following deflation do not equal the effects of price stability. The best remedy for inflation is to prevent it in the first place. But even that may have its costs, as we shall see later.

SHIFTS OF THE SUPPLY CURVE OF OUTPUT

Shifts in the supply curve of output may also bring about changes in the rate of output, the prices of output, and the state of employment and unemployment. Instead of dealing with these in detail, we shall mention only a few cases.

1. **Supply Curve Shifts to the Right but Is Not Lowered.** This may result from anything that increases the productive capacity of the economy without lowering costs per unit of output; for example, a growth of the labor supply without any change in output per man-hour or any change in money wage rates. If the demand curve remains unchanged, the effect will be a decrease in prices or a failure of the economy to expand its output to the new higher potential level. If wage rates and other costs are inflexible downward, the latter may result. This suggests that in an economy with a rising supply of productive factors, the demand for output should be increased roughly in proportion. One of the objectives of monetary policy should be to assure a secular increase in the money supply, large enough to permit aggregate demand for output to keep pace with the growth of the labor force and the stock of real capital. Any slower rate of increase of the money supply would be deflationary.

2. **Supply Curve Shifts Downward.** That is, producers become willing to offer each amount of output at a lower price. This might result from technological advances that increase output per man-hour without an offsetting rise of wage rates, so that cost per unit is lowered. If the demand for output remains unchanged, the effect will be to lower prices or to raise output, or both. Price declines matched by decreases in costs need not be depressing to the economy, for they do not decrease the profitability of production. However, if increases in average output per man-hour are accompanied by proportional increases in average money wage rates, cost of production will not be reduced and aggregate demand for output will have to be increased if repressive effects on the growth of output and employment are to be avoided.

3. **Supply Curve Shifts Upward.** In this situation, producers become will-

ing to offer each amount of output only at a higher price. This might result from irresistible demands by labor for wage increases more than in proportion to increases in output per man-hour, thereby raising producers' cost schedules. If the demand cur.e for output remains unchanged, the effect will be to raise the prices of output or to lower output and employment, or some combination of these. This is often called the *cost push* type of inflation. Such upward shifts of cost and supply curves may pose serious problems for the fiscal and monetary authorities. If they reduce the demand for output to prevent price increases from occurring, or, even if they refuse to increase the demand for output enough to maintain the level of output and employment, they will be criticized for condoning unemployment and underproduction. They may even be blamed for it. But if they raise the demand for output enough to prevent any decline of output and employment, they facilitate price increases. If employers and employees are allowed to become confident that such a policy will always be followed, the effect may be to encourage a wage-price spiral. Employees, confident that they will not lose their jobs, will be encouraged to demand excessive increases in their wage rates. Employers, confident that demand will be increased enough to allow them to pass through all cost increases in the form of price increases without losing sales, may have little incentive to put up a strong resistance to wage demands. This is especially true if they know that their competitors will grant the same wage increases and raise their prices.

CONCLUSIONS

This chapter has had the limited objective of presenting some background materials that facilitate our understanding of the relationships between money and monetary policy and such economic phenomena as the rate of real output, the price level of output, the money value of output, and the state of employment and unemployment. We have dealt with some of these materials in an incomplete and oversimplified way. Perhaps the most outstanding instance was our incomplete treatment of the interrelationships of demand and supply: how shifts of the demand schedule for output may shift the supply schedule, and vice versa. We shall return to this point later. Nevertheless, several of our findings will be useful:

1. The rate of real output, the price level of output, the money value of output, and the state of employment are all determined simultaneously by supply and demand conditions. They are not determined singly and independently of each other.
2. Since all these things are determined by demand and supply con-

ditions and can be changed only by changes in demand, or supply, or both, money and monetary policy can affect them only by affecting the demand for output or the supply of output. We should be suspicious of any form of monetary theory that does not indicate the process through which money achieves its effects. Generally speaking, money and monetary policy affect other economic variables primarily through their effects on the actual and prospective demand for output, though by changing the level of demand they may shift the supply curve of output. For example, an expansionary monetary policy that raises the demand for output may induce a rise in wage rates and the prices of other productive factors, thereby raising producers' cost schedules and shifting upward their supply curves. One of the major tasks of monetary theory is to analyze the relationship between the size of the money supply and the behavior of the demand for output.

3. The effects of any given change in the demand for output, whether induced by monetary policy or other forces, depend on the response of the supply of output. For example, a rise of demand when the economy is already operating at capacity levels may be reflected wholly in pure price inflation, with no change in either output or employment. But the same rise of demand starting from a situation of widespread unemployment and excess capacity may be reflected largely in expanded output and employment. A decrease of demand in a community in which costs and prices are freely flexible downward may be manifested largely in pure price deflation. But the same decrease of demand in a community characterized by cost and price structures that adjust downward only slowly, if at all, may be reflected largely in shrunken output and employment.

It follows that a monetary theory that would explain the relations between monetary policy and these other economic phenomena must concern itself not only with effects on the demand for output, but also with the responsiveness of supply. Thus, it is led into such matters as the degree of utilization of productive resources, the upward and downward adjustability of money wage rates, and producers' output and price policies. These may differ significantly from one country to another and even from one period to another in a given country.

13. Gross National Product or Expenditures

This chapter will deal with the flow of expenditures for output, or the aggregate money demand for output. More specifically, it will consider the most widely used measure of these expenditures: the gross national product, the various classes of expenditures making up this total, relationships between expenditures for output and the money incomes received within the nation, and the roles of saving and investment in the circular flow process.

It should be emphasized that this chapter provides no theory of the behavior of national income. It does not explain *why* the level of national income in any period was what it was rather than being higher or lower, nor does it explain *why* income changed as it did from one period to another. Instead, it uses an accounting approach to record what did happen to the total and its components. In earlier chapters, we employed balance-sheet accounting to deal with the stock of assets of the various monetary institutions and claims against those assets at stated points in time. Now we use double-entry income accounting to deal with flows over stated periods of time. On the one hand, income accounting shows the amount of income created during any period and the sources of that income. On the other, it shows claims against that income, or the shares of income accruing to the various claimants. It emphasizes that the total of income shares accruing to the various claimants during any period must be exactly equal to the amount of income created or produced during that period. A clear and thorough understanding of these things is essential for later theoretical chapters. An accounting

approach forces us to identify the various components of income and to define them clearly. It also suggests some of the relationships among them.

NATURE OF GNP

Gross national product or expenditure, popularly known as GNP, is the market value of the output of goods and services produced by a nation's economy during a stated period of time before deduction of depreciation charges and other allowances for business and institutional consumption of durable capital goods.[1] It is usually stated at an annual rate. It avoids double counting and includes the nation's entire output once and only once. Thus, it does not add together the values of autos produced and sold by the manufacturer to the dealer and by the dealer to consumers; it includes only their value at the point of final sale. It does not add together the values of the flour and other components of the bread produced and the values of bread sold by the baker to the merchant and by the merchant to the final buyer; it includes only the value of the bread at its point of final sale. Thus, GNP includes the value of all output at its point of final sale, and this value includes all the values added at earlier stages of processing and handling.

It is important to note that GNP may be viewed and measured in at least two principal ways: (1) as the market value of output or expenditures for output during a stated period, and (2) as the sum of the shares of gross income accruing to the members of the nation during the period. We shall emphasize that the total of the gross income shares accruing to the members of the community during any period must be exactly equal to the market value of output or expenditures for output during that period.

Since GNP is the market value of output, its behavior reflects changes in the prices of output as well as in real output. This is illustrated in Fig. 13–1. The line "GNP (current prices)" reflects the value of output in each year at the average prices of output prevailing during that year. The line "GNP (1954 prices)" attempts to show the behavior of real output by valuing output in every year at the average prices prevailing in 1954. The line "Price index of output" shows the price levels of output in the various years as percentages of the prices prevailing in 1954. A

[1] For excellent descriptions of GNP and other income concepts, as well as a wealth of statistical materials relating to the behavior of GNP and its components since 1929, see U.S. Department of Commerce, *National Income*, Washington, D.C., U.S. Government Printing Office, 1954, and *U.S. Income and Output*, Washington, D.C., U.S. Government Printing Office, 1959. For later data see the *Survey of Current Business* for July of each year.

study of Fig. 13–1 reveals how important it is to distinguish between real output and the market value of output. For example, owing to a fall of demand between 1929 and 1933, the market value of output fell 46 percent. This reflected decreases of 31 percent in real output and 23 percent in the prices of output. Between 1933 and 1945, the market value of output rose 281 percent, reflecting increases of 153 percent in real output and 50 percent in the prices of output. The 163 percent rise in the market

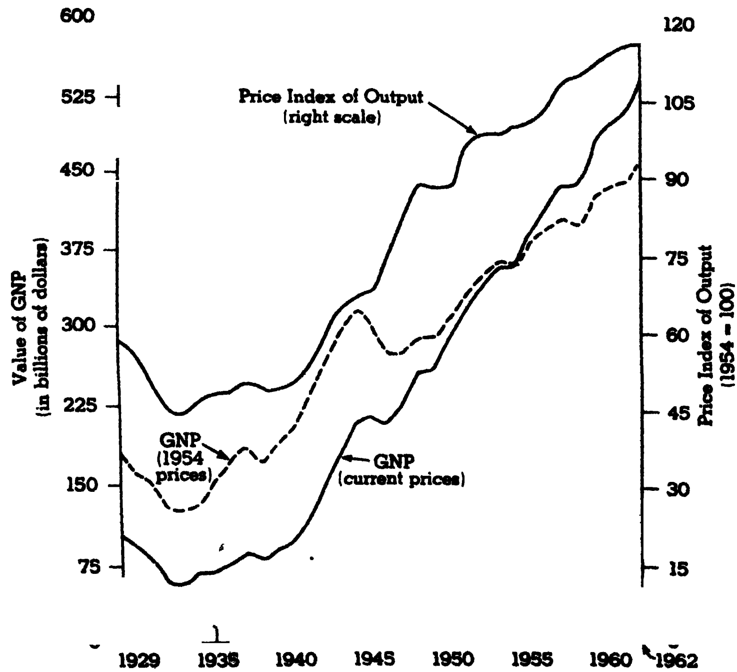

FIG. 13–1. Gross National Product, 1929–1962.

value of output between 1946 and 1962 reflected increases of 68 percent in real output and 56 percent in the price level of output.

GNP AS EXPENDITURES FOR OUTPUT

GNP is composed of four main categories of expenditures for output:

1. Personal consumption expenditures
2. Gross private domestic investment
3. Net exports of goods and services
4. Government purchases of goods and services.

GNP for any given period is therefore equal to the sum of these four types of expenditures, and it varies with their total. This is shown in Table 13–1.

Personal Consumption

Personal consumption expenditures include all purchases of current output by consumers. These include durable consumers' goods, nondu-

TABLE 13–1. Gross National Product as Expenditures for Output, 1929–1962
(In billions of dollars)

Year	GNP	Personal Consumption	Gross Private Domestic Investment	Net Exports of Goods and Services	Government Purchases of Goods and Services
1929	$104.4	$ 79.0	$16.2	$0.8	$ 8.5
1930	91.1	71.0	10.3	0.7	9.2
1931	76.3	61.3	5.5	0.2	9.2
1932	58.5	49.3	0.9	0.2	8.1
1933	56.0	46.4	1.4	0.2	8.0
1934	65.0	51.9	2.9	0.4	9.8
1935	72.5	56.3	6.3	..	10.0
1936	82.7	62.6	8.4	..	11.8
1937	90.8	67.3	11.7	..	11.7
1938	85.2	64.6	6.7	1.1	12.8
1939	91.1	67.6	9.3	0.9	13.3
1940	100.6	71.9	13.2	1.5	14.1
1941	125.8	81.9	18.1	1.1	24.8
1942	159.1	89.7	9.9	−0.2	59.7
1943	192.5	100.5	5.6	−2.2	88.6
1944	211.4	109.8	7.1	−2.1	96.5
1945	213.6	121.7	10.4	−1.4	82.9
1946	210.7	147.1	28.1	4.9	30.8
1947	234.3	165.4	31.5	9.0	28.4
1948	259.4	178.3	43.1	3.5	34.5
1949	258.1	181.2	33.0	3.8	40.2
1950	284.6	195.0	50.0	0.6	39.0
1951	329.0	209.8	56.3	2.4	60.5
1952	347.0	219.8	49.9	1.3	76.0
1953	365.4	232.6	50.3	−0.4	82.8
1954	363.1	238.0	48.9	1.0	75.3
1955	397.5	256.9	63.8	1.1	75.6
1956	419.2	269.9	67.4	2.9	79.0
1957	442.8	285.2	66.1	4.9	86.5
1958	444.5	293.2	56.6	1.2	93.5
1959	482.7	313.5	72.7	−0.8	97.2
1960	502.6	328.2	71.8	3.0	99.6
1961	518.2	336.8	69.0	4.5	107.9
1962	554.9	355.4	78.8	3.8	117.0

SOURCE: *Survey of Current Business*, July, 1963, p. 12.

rable consumers' goods, and consumers' services. The durables include such things as new automobiles, TV sets, refrigerators, and furniture. The nondurables include food, beverages, clothing, tobacco, and so on. Consumers' services embrace a wide variety of services such as shelter, medical care, barber and beauty services, domestic service, and admissions to theaters and professional sporting events. All these are, of course, valued at their market prices.

Gross Private Domestic Investment

Every word in this title is important. The term *investment*, as used here, has nothing directly to do with buying stocks, bonds or any other type of financial instrument. We use it here and in the succeeding sections to mean simply expenditures for the current output of goods and services for the purpose of maintaining and increasing the stock of capital goods. The "domestic" indicates that we include here only expenditures for the purpose of maintaining or increasing the stock of capital goods at home, not those for maintaining or building up capital abroad. "Private" means that only private expenditures for these purposes are included, not those by the government. The term *gross* indicates that we include expenditures for output to offset the depreciation of capital goods as well as to make net additions to the stock. If we deduct from gross private domestic investment for any period the depreciation or "using up" of capital during the period, we arrive at net private domestic investment, the net increase in the stock of these goods during the period.

Gross private domestic investment is made up of three broad classes of expenditures for output:

1. New construction, both residential and nonresidential: Residential construction is the value of output of new dwelling units during the stated period, both single and multiple units. Nonresidential construction embraces the output of such things as new farm, industrial, commercial, public utility, and private college buildings and new dams by privately owned public utilities.
2. Producer's durable equipment: This includes the output of such things as farm machinery, manufacturing equipment, scientific instruments, railroad rolling stock, accounting machines, store fixtures, and all other types of equipment used for production.
3. Net changes in the size of business inventories.

The term *net changes in business inventories* requires further clarification. Business inventories in existence at any point in time are, of course, a part of the community's stock of capital goods; they are raw materials, goods in process, and finished goods held by business firms to facilitate their operations. Some of these are held by the firms that produced them;

GNP for any given period is therefore equal to the sum of these four types of expenditures, and it varies with their total. This is shown in Table 13–1.

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Personal consumption expenditures include all purchases of current output by consumers. These include durable consumers' goods, nondu-

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(In billions of dollars)

Year	GNP	Personal Consumption	Gross Private Domestic Investment	Net Exports of Goods and Services	Government Purchases of Goods and Services
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1931	76.3	61.3	5.5	0.2	9.2
1932	58.5	49.3	0.9	0.2	8.1
1933	56.0	46.4	1.4	0.2	8.0
1934	65.0	51.9	2.9	0.4	9.8
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1938	85.2	64.6	6.7	1.1	12.8
1939	91.1	67.6	9.3	0.9	13.3
1940	100.6	71.9	13.2	1.5	14.1
1941	125.8	81.9	18.1	1.1	24.8
1942	159.1	89.7	9.9	−0.2	59.7
1943	192.5	100.5	5.6	−2.2	88.6
1944	211.4	109.8	7.1	−2.1	96.5
1945	213.6	121.7	10.4	−1.4	82.9
1946	210.7	147.1	28.1	4.9	30.8
1947	234.3	165.4	31.5	9.0	28.4
1948	259.4	178.3	43.1	3.5	34.5
1949	258.1	181.2	33.0	3.8	40.2
1950	284.6	195.0	50.0	0.6	39.0
1951	329.0	209.8	56.3	2.4	60.5
1952	347.0	219.8	49.9	1.3	76.0
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Gross Private Domestic Investment

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1. New construction, both residential and nonresidential: Residential construction is the value of output of new dwelling units during the stated period, both single and multiple units. Nonresidential construction embraces the output of such things as new farm, industrial, commercial, public utility, and private college buildings and new dams by privately owned public utilities.
2. Producer's durable equipment: This includes the output of such things as farm machinery, manufacturing equipment, scientific instruments, railroad rolling stock, accounting machines, store fixtures, and all other types of equipment used for production.
3. Net changes in the size of business inventories.

The term *net changes in business inventories* requires further clarification. Business inventories in existence at any point in time are, of course, a part of the community's stock of capital goods; they are raw materials, goods in process, and finished goods held by business firms to facilitate their operations. Some of these are held by the firms that produced them;

others are held by firms in later stages of the production-distribution process, such as fabricators of raw materials, wholesalers, or retailers, who purchased them from their producers. A net increase in business inventories during a given period is "investment" because it is an addition to the stock of capital goods. A net decrease of business inventories during a period is negative investment, or disinvestment, for it represents a decrease in the stock of capital goods. The net change of business inventories during any period is equal to total output minus final sales, for output tends to increase inventories, and sales to reduce them.

Changes in the volume of output used to increase or decrease inventories are an important source of fluctuations in GNP and employment over short periods. To illustrate this point, let us assume that the rate of final sales remains constant but that the rate of change of inventories varies. Suppose that in the first period, business is increasing its inventories at an annual rate of $4 billion. GNP will be equal to final sales plus the $4 billion of output used to effect the net increase of business inventories. This rise of inventories represents expenditures for output, either expenditures by firms that bought the output from other firms or production expenditures by firms that produced the goods and held them. It also provided employment. Suppose that in the next period, business firms reduce their output enough to decrease their inventories at an annual rate of $4 billion. GNP will be equal to final sales minus $4 billion. Thus, the shift by business from increasing its inventories at a rate of $4 billion a year to decreasing its inventories at a rate of $4 billion a year tends directly to lower GNP by $8 billion and also to lower employment. By reducing the incomes of producers and workers, it may induce still further declines of GNP by decreasing consumption expenditures.

In the example given above, where final sales were assumed to continue at a constant rate, fluctuations in the rate of change of inventories were a source of fluctuations of GNP. But this item can be a stabilizing force, at least in the short run, if it moves counter to changes in the rate of final sales. Suppose, for example, that the rate of final sales falls by $5 billion. GNP may remain constant, at least temporarily, if business maintains its rate of output and increases its rate of inventory accumulation. However, if this increase of inventory is "unwanted," business may later reduce output sharply, to draw down its inventories. The adjustment of output to the decline of final sales is delayed, but it may be magnified. Suppose, on the other hand, that the rate of final sales rises by

$5 billion. This need not be reflected in the current rate of output if business offsets it by allowing its inventories to be drawn down. But when inventories fall below desired levels, business may try to increase output sharply, to replenish them.

Net Exports of Goods and Services

American exports during any period represent the amount of our output of goods and services taken by the rest of the world. Our imports of goods and services represent the amount of the output of the rest of the world taken by us for use by our private and public sectors. Thus, our exports represent the net amount of our output taken by other countries. We can, of course, have net imports, though, in fact, we have had net exports during most of the recent years.

Suppose that during some year,

Exports	=	$29 billion
Imports	=	25 billion
Net exports	=	$ 4 billion

The $4 billion of net exports can be looked at in two ways: (1) as the net value of our output taken by the rest of the world, and (2) as the net amount of income shares created for Americans in transactions with other countries. Americans use a part of their income to buy imports. On the other hand, foreign purchases of our output create value of output and income shares for Americans producing that output. Thus, our net exports represent net contributions to demands for our output by the rest of the world.

We shall see later that exports and imports are important items in our balance of international payments. In the meantime, we shall treat net exports solely as an offset to saving, which is a method of injecting saving back into the flow of expenditures for output. An act of saving, taken by itself, tends to lower expenditures for output, for it is that part of gross national income not spent for consumption. One offset to saving, or a way of reinjecting saving, into the expenditure stream, is gross private domestic investment. Another is net exports. For example, foreign countries may borrow some of our savings and spend them for our net exports. Or they may buy our net exports with gifts and grants received from us or with funds from other sources.

Because both gross private domestic investment and net exports are offsets to saving, we shall add them together and call them *gross investment*, or "offsets to saving."

Government Purchases of Goods and Services

Government purchases include the expenditures of the federal, state, and local governments for the current output of goods and services. These are of two major types:

1. Direct expenditures for the services of productive factors, primarily for labor. In this category are the services of both military and civilian government personnel. These services are valued at the prices paid for them by the government.
2. Expenditures for the output of business firms. These are large and diverse; they include government expenditures for construction materials and services, military equipment and supplies, red tape, and the tens of thousands of other items purchased by government from private producers.

Business firms provide employment and produce in response to government demand much as they would if the demand emanated from private sources.

Summary

We find, then, that GNP for any period is the sum of expenditures for output in the form of personal consumption, gross private domestic investment, net exports of goods and services, and government purchases of goods and services. GNP therefore fluctuates with the sum of these four types of expenditures.

For convenience we shall denote these expenditures by the following symbols:

C = personal consumption
I = total gross investment; it is the sum of gross private investment and net exports of goods and services
G = government purchases of goods and services
Y = GNP, or gross national product

Thus, for any period,

$$Y = C + I + G$$

The reader will find it instructive to study carefully Table 13–1, noting the size and variability of GNP, the relative sizes of its various components, and their variability.

GNP AS GROSS NATIONAL INCOME

We noted earlier that GNP may be viewed not only as the value of output or expenditures for output but also as the sum of gross national income shares accruing to the members of the community, including the

government. We also noted that the sum of these shares accruing to the community during any period must be exactly equal to the value of output or expenditures. On reflection, this becomes almost obvious. Value created must accrue to someone; it cannot disappear in thin air. Nor can the community as a whole receive values that are not created. To put the same thing another way, expenditures made must be received by someone, but no one can receive expenditures that are not made.

This is shown in Table 13–2. For each period the sum of the distributive shares of gross national income indicated by the column heads is determined by, and equal to, total expenditures for output. A part of these expenditures accrues to the government as income in the form of indirect business taxes, by which we mean all business taxes except those on corporate net income. These include taxes on production and sales by business, license fees of business, taxes on business property, and so on. The remainder of GNP accrues to private business and individuals as gross money income before any taxes except indirect business taxes. One part accrues to business in the form of depreciation and other capital-consumption allowances. This is not net income, but it is a part of the expenditures for output received by business and at its disposal. Another part accrues as compensation of employees, in the form of wages, salaries, commissions, and so on. Another part accrues as rental incomes of persons, and another in the form of interest. All the remainder accrues as profits of business enterprises—as earnings of unincorporated enterprises and as corporate profits. This is a residual claim; all the value of business output not claimed by others accrues to the owners of business.

These relations between expenditures for output and income receipts suggest both the interrelatedness of the various sectors of the economy and the nature of the circular flow of income. Suppose we divide the economy into three major sectors: consumer households, business, and government. The interrelationships are so numerous and complex that we can mention only a few. The government receives income in the form of taxes from both households and business. It creates income for both by purchasing goods and services. Its expenditures for labor directly create income for households; its expenditures for the output of business create income for both business and households. Households pay income to the government in the form of taxes and create income for business by their expenditures; in turn, they receive income from both the government and business. Business, too, both receives income from, and pays income to, the other sectors.

As already noted, the flow of income is a circular flow. Expenditures for output become income receipts, these income receipts are spent for

TABLE 13–2. Gross National Product as the Sum of Gross Income Shares, 1929–1962
(in billions of dollars)

Year	Total Gross National Income	Indirect Business Taxes	Business Capital Consumption Allowances	Compensation of Employees	Rental Income of Persons	Net Interest Income	Earnings of Unincorporated Business[a]	Corporate Profits[a]
1929	$104.4	$ 7.0	$ 8.6	$ 51.1	$ 5.4	$ 6.4	$14.8	$10.1
1930	91.1	7.2	8.5	46.8	4.8	6.0	11.5	6.6
1931	76.3	6.9	8.2	39.7	3.8	5.8	8.7	1.6
1932	58.5	6.8	7.6	31.0	2.7	5.4	5.3	−2.0
1933	56.0	7.1	7.2	29.5	2.0	5.0	5.6	−2.0
1934	65.0	7.8	7.1	34.3	1.7	4.9	7.0	1.1
1935	72.5	8.2	7.2	37.3	1.7	4.8	10.4	2.9
1936	82.7	8.7	7.5	42.9	1.8	4.7	10.5	5.0
1937	90.8	9.2	7.8	47.9	2.1	4.7	12.7	6.2
1938	85.2	9.2	7.8	45.0	2.6	4.6	11.1	4.3
1939	91.1	9.4	7.8	48.1	2.7	4.6	11.6	5.7
1940	100.6	10.0	8.2	52.1	2.9	4.5	13.0	9.1
1941	125.8	11.3	9.0	64.8	3.5	4.5	17.4	14.5
1942	159.1	11.8	10.2	85.3	4.5	4.3	23.9	19.7
1943	192.5	12.7	10.9	109.6	5.1	3.7	28.2	23.8
1944	211.4	14.1	12.0	121.3	5.4	3.3	29.6	23.0
1945	213.6	15.5	12.6	123.2	5.6	3.2	30.8	18.4
1946	210.7	17.3	10.7	117.7	6.2	3.1	36.6	17.3
1947	234.3	18.6	13.0	128.8	6.5	3.8	35.5	23.6
1948	259.4	20.4	15.5	141.0	7.3	4.2	40.2	30.8
1949	258.1	21.6	17.3	140.8	8.3	4.8	35.6	28.2
1950	284.6	23.7	19.1	154.2	9.0	5.5	37.5	35.7
1951	329.0	25.6	22.0	180.3	9.4	6.3	42.3	41.0
1952	347.0	28.1	24.0	195.0	10.2	7.1	42.2	37.7
1953	365.4	30.2	26.5	208.8	10.5	8.2	40.7	37.3
1954	363.1	30.2	28.8	207.6	10.9	9.1	40.4	33.7
1955	397.5	32.9	32.0	223.9	10.7	10.4	42.1	43.1
1956	419.2	35.7	34.4	242.5	10.9	11.7	43.7	42.0
1957	442.8	38.2	37.4	255.5	11.9	13.4	44.5	41.7
1958	444.5	39.3	38.6	257.1	12.2	14.8	46.1	37.2
1959	482.7	42.6	41.0	278.5	11.9	16.4	46.5	47.2
1960	502.6	46.4	43.0	293.6	12.1	18.1	46.2	44.5
1961	518.2	49.1	44.3	302.1	12.1	20.0	48.1	43.8
1962	554.9	53.0	49.4	322.9	12.0	22.0	49.8	47.0

[a] After inventory valuation adjustment.

SOURCE: *Survey of Current Business*, July, 1963, p. 12. For some years the components do not give exactly the totals shown. This is due partly to rounding, partly to statistical discrepancies in the original data, and partly to the elimination of minor items under the headings of "government subsidies minus current surplus of government enterprises" and "business transfer payments."

output, these spendings create income receipts, and so on. If this circular flow continued at a constant rate, GNP would, of course, remain at a constant level. But we know that the circular flow sometimes slows down and lowers GNP, and at other times it speeds up and raises GNP. This raises several important questions. Through what processes do these rises and falls occur? How are they related to the ways that income recipients dispose of their incomes? Which types of income disposal tend to maintain or increase expenditures for output; which types to lower expenditures? As a first step toward answering these questions, we shall analyze the disposal of income receipts.

DISPOSAL OF INCOME AND THE CIRCULAR FLOW

For the purpose of analyzing the disposal of income receipts, the classification of income shares used in Table 13–2 is inadequate. In the first place, it shows income shares by functional type rather than by type of recipient. In the second place, it shows income shares before any taxes, except indirect business taxes, and also before transfer payments. For our analysis of income disposal, we shall divide income recipients into three classes—government, business, and persons or households—and consider their "disposable incomes," by which we mean the amounts of money income left at their disposal after taxes and all transfer payments.

As indicated in Table 13–3, the total disposable gross national income for any period must be exactly equal to GNP for that period, and it must fluctuate with GNP. It is equal to the sum of disposable government income, disposable business income, and disposable personal income. Let us look at each of these in turn.

Disposable Government Income

We start with total government receipts, as shown in column 1 of Table 13–4. These include all revenues accruing to federal, state, and local governments—not only indirect business taxes but also personal and corporate income taxes, property taxes on households, license fees, contributions for social insurance, and so on. In recent years, total taxes have taken more than a quarter of GNP. Taxes obviously tend to reduce the disposable incomes of households and business—their incomes after taxes. However, the government uses some of its total receipts to make domestic transfer payments, which we shall denote by P_D. By domestic transfer payments by government we mean all its domestic expenditures for which it does not receive goods and services in return. These are not a part of the government's demand for output. They consist chiefly of

TABLE 13-3. Disposable Gross National Income, 1929–1962
(in billions of dollars)

Year	Total Gross Disposable Income (= GNP)	Disposable Income of Government	Disposable Business Income	Disposable Personal Income	Total Disposable Private Income (3) + (4)	Statistical Discrepancy
1929	$104.4	$ 9.6	$11.5	$ 83.1	$ 94.6	$0.3
1930	91.1	9.0	8.8	75.4	83.2	−1.0
1931	76.3	6.4	5.2	63.8	69.0	0.8
1932	58.5	6.4	2.7	48.7	51.4	0.8
1933	56.0	6.6	2.6	45.7	48.3	0.9
1934	65.0	7.5	4.9	52.0	56.9	0.7
1935	72.5	8.1	6.3	58.3	64.5	−0.2
1936	82.7	8.9	6.5	66.2	72.8	1.1
1937	90.8	12.3	7.8	71.0	78.7	−0.2
1938	85.2	11.2	7.8	65.7	73.5	0.5
1939	91.1	11.2	8.3	70.4	78.7	1.2
1940	100.6	13.3	10.4	76.1	86.4	0.8
1941	125.8	21.0	11.5	93.0	104.5	0.4
1942	159.1	28.3	14.2	117.5	131.6	−0.8
1943	192.5	44.4	16.3	133.5	149.6	−1.7
1944	211.4	44.6	17.2	146.8	164.2	2.8
1945	213.6	43.2	15.6	150.4	165.9	4.5
1946	210.7	34.8	13.1	160.6	173.7	2.1
1947	234.3	41.8	18.9	170.1	189.0	3.5
1948	259.4	44.3	26.6	189.3	215.9	−0.8
1949	258.1	40.3	27.6	189.7	216.3	1.5
1950	284.6	50.0	27.7	207.7	235.4	−0.8
1951	329.0	68.8	31.6	227.5	259.1	2.0
1952	347.0	73.7	33.3	238.7	272.0	−1.3
1953	365.4	77.3	34.4	252.5	286.9	1.2
1954	363.1	69.9	35.5	256.9	292.4	0.8
1955	397.5	80.0	42.0	274.4	316.4	1.1
1956	419.2	85.6	43.0	292.9	335.9	−2.3
1957	442.8	88.9	45.6	308.8	354.4	−0.5
1958	444.5	83.3	44.7	317.9	362.6	—
1959	482.7	97.1	51.3	337.1	388.4	−2.8
1960	502.6	105.1	50.6	349.9	400.5	−3.0
1961	518.2	104.8	50.8	364.4	415.2	−1.8
1962	554.9	114.5	57.7	384.4	442.1	−1.7

SOURCE: Computed from various tables in *Survey of Current Business*. The components were calculated as follows: (1) Data on disposable personal income were taken directly from the national income accounts. (2) Disposable business income was secured by adding capital consumption allowances and undistributed corporate profits after inventory valuation adjustments. (3) Disposable government income was computed by deducting from total government receipts all government expenditures except government purchases of goods and services and foreign transfer payments. These government transfer payments were computed by deducting government purchases of goods and services from total government expenditures.

social security benefits, relief payments, bonuses and other benefits to veterans and their dependents, interest on the federal debt, and net subsidies. Most of these go to households, though some accrue to business. These domestic transfer payments by government obviously contribute to the disposable incomes of households and business. Column 2 of Table 13–4 shows that these have become very large.

We shall define the government's disposable income for any period (T_n) as its total receipts minus its domestic transfer payments (P_D). Thus, $T_n = T - P_D$. How does the government dispose of its disposable income (T_n)? One way is to spend for goods and services (G). If G is exactly equal to T_n, the government tends to maintain the circular flow constant, for its spendings create money income equal to the net income extracted from others. But G may be either smaller or larger than T_n. We shall call $T_n - G$ *government saving* and designate it by S_g. Thus,

$$S_g = T_n - G$$

S_g is, of course, positive when G is less than T_n and negative when G exceeds T_n. When S_g is negative, it will be called *government dissaving.*

We call the quantity $T_n - G$ government saving because it is so comparable, both in nature and in effects, with private saving. As we shall see, private saving is simply that part of private disposable income that is not returned to the market for output as expenditures for consumption during the stated period. It also represents that part of private disposable income available to finance gross private domestic investment and net exports of goods and services. Similarly, S_g is that part of the government's disposable income that it does not return to the market as expenditures for output. Moreover, S_g, as is private saving, is a potential source of funds to finance gross private domestic investment or net exports of goods and services. For example, suppose that, during some period, S_g is $5 billion. The government may use at least some part of these funds to make gifts and grants to foreigners, or to lend to them, thereby helping finance net exports of goods and services; or it may use at least some of the funds to retire debt held by American financial institutions or individuals. The recipients of the money are thus put in a position to spend for investment or to lend to others for such purposes. The government may, of course, fail to make its savings available for use, or the savings may for other reasons fail to find their way into investment spending, but the same is true of private saving.[3] Government

[3] Government saving or dissaving is not the same as the government's surplus or deficit of income and product account. In arriving at the latter, we deduct from T not only P_D and G, but also net government transfers to foreigners. We include in S_g the government net transfers to foreigners, both because they represent net amounts extracted from private disposable incomes and because they are available to finance net exports.

TABLE 13–4. Government Income and Its Disposal, 1929–1962
(in billions of dollars)

Year	(Col. 1) Total Government Receipts (T)	(Col. 2) Domestic Transfer Payments (P_d)	(Col. 3) Government Disposable Income (T_n)	(Col. 4) Government Purchases of Goods and Services (G)	(Col. 5) Government Saving (Col. 3 − Col. 4) (S_g)
1929	$ 11.3	$ 1.7	$ 9.6	$ 8.5	$ 1.0
1930	10.8	1.8	9.0	9.2	− 0.3
1931	9.5	3.1	6.4	9.2	− 2.8
1932	8.9	2.5	6.4	8.1	− 1.7
1933	9.3	2.7	6.6	8.0	− 1.4
1934	10.5	3.0	7.5	9.8	− 2.4
1935	11.4	3.3	8.1	10.0	− 2.0
1936	13.0	4.1	8.9	11.8	− 3.0
1937	15.4	3.1	12.3	11.7	0.6
1938	15.0	3.8	11.2	12.8	− 1.6
1939	15.4	4.2	11.2	13.3	− 2.1
1940	17.7	4.4	13.3	14.1	− 0.7
1941	25.0	4.0	21.0	24.8	− 3.8
1942	32.6	4.3	28.3	59.7	−31.8
1943	49.2	4.8	44.4	88.6	−44.2
1944	51.2	6.6	44.6	96.5	−51.9
1945	53.2	10.0	43.2	82.9	−39.7
1946	51.1	16.3	34.8	30.8	4.1
1947	57.1	15.3	41.8	28.4	13.4
1948	59.2	14.9	44.3	34.5	9.8
1949	56.5	16.2	40.3	40.2	0.1
1950	69.3	19.3	50.0	39.0	11.0
1951	85.5	16.7	68.8	60.5	8.3
1952	90.6	16.9	73.7	76.0	− 2.3
1953	94.9	17.6	77.3	82.8	− 5.5
1954	90.0	20.1	69.9	75.3	− 5.4
1955	101.4	21.4	80.0	75.6	4.4
1956	109.5	23.9	85.6	79.0	6.6
1957	116.2	27.3	88.9	86.5	2.4
1958	115.1	31.8	83.3	93.5	−10.2
1959	130.1	33.0	97.1	97.2	− 0.1
1960	140.7	35.6	105.1	99.6	5.5
1961	145.5	40.7	104.8	107.9	− 3.1
1962	156.7	42.2	114.5	117.0	− 2.5

dissaving, an excess of G over T_n, has effects on the level of money income similar to those of private investment expenditures, for it too is an offset to saving, a way of converting private saving into expenditures for output. The simplest example is that in which the government borrows private savings and uses them to finance its deficit spending for output.

Several points about government fiscal operations should be emphasized because of their importance to our later analysis:

1. Government expenditures are an important determinant of both the total demand for output and private disposable incomes. Increases of G increase directly the total demand for output and also contribute to the private disposable incomes of those who produce for the government. Decreases of G have the opposite effects.

2. Total private disposable incomes (the sum of business and household disposable incomes) for any period are equal to total GNP minus T_n. If we use Y to designate gross national product and Y_p to designate total private disposable income, we can state this as follows:

$$Y_p = Y - T_n$$

Since $T_n = T - P_D$, we can also state this as follows:

$$Y_p = Y - T + P_D$$

This suggests that at any given level of Y, the government can increase private disposable incomes by decreasing T or by increasing P_D.

3. We have now identified the three broad classes of fiscal actions that the government can use to influence the behavior of gross national product: G, T, and P_D. It tends to raise Y by increasing G, by increasing P_D, or by decreasing T. Increases of G directly increase the total demand for output and contribute to private disposable incomes. Increases of P_D and decreases of T do not directly affect the demand for output, but they do tend to increase private disposable income, which usually tends to increase private demands for output. On the other hand, the government can tend to lower Y by decreasing G, by decreasing P_D, or by increasing T. Decreases of G directly decrease the demand for output and also private disposable income. Decreases of P_D and increases of T do not directly decrease the demand for output, but by lowering private disposable incomes, they tend to reduce private demands for output.

4. Government saving (S_g) is quite comparable in nature and effects to private saving. It is that part of the gross national income taken by the government in taxes and not spent as domestic transfer payments and as government purchases of goods and services. It also represents a part of national money income available to finance private investment

and net exports. Government dissaving (an excess of G over T_n) is an offset to private saving, a way of channeling a part of private saving into expenditures for output.

Disposable Business Income

Disposable business income is the amount of gross money income left at the disposal of business after all taxes and transfer payments. As shown in Table 13–5, disposable business income is made up of two parts:

1. **Capital Consumption Allowances.** As indicated earlier, a part of expenditures for output accrues to business firms as depreciation and other allowances for declines in value of capital goods during a period. This is not net income, but it is a part of gross national income that remains at the disposal of business firms. Because of the huge stock of depreciable assets held by business and the widespread practice of charging off depreciation annually, these flows are very large. In the early 1960s their level was approaching $50 billion, and they accounted for considerably more than half of total gross saving in the United States.

2. **Undistributed Corporate Profits.** Undistributed profits, or the part of corporate net profits after taxes, that are retained by corporations and not paid out to stockholders fluctuate widely. During periods of unusually high profits, corporations often retain a large fraction of their net earnings after taxes. But in periods of low profits or losses, they may pay out more than their current net earnings; their undistributed profits may be negative.

How does business dispose of its disposable income? All of it is "saved"; none of it is spent for consumption. To emphasize this aspect of disposable business income, we shall refer to it also as gross business saving and denote it by the symbol S_b. A business firm may, of course, use some of its own S_b to finance its own current expenditures for output to maintain or increase its stock of capital goods. But this need not occur; a firm may use such savings in ways that do not directly contribute to expenditures for output: to add to its money balances, to retire debt or other claims against itself, to buy securities, and so on. Even if these savings are transferred to others, they, like personal savings, may fail to find their way into expenditures for output.

Disposable Personal Income

Disposable personal income during a stated period is the money income remaining at the disposal of persons (or households) after all taxes and transfer payments. We can arrive at personal disposable income in either of two ways:

TABLE 13–5. Disposable Business Income, 1929–1962
(In billions of dollars)

Year	Total Disposable Business Income	Capital Consumption Allowances	Undistributed Corporate Profits[a]
1929	$11.5	$ 8.6	$ 2.9
1930	8.8	8.5	0.2
1931	5.2	8.2	−3.0
1932	2.7	7.6	−4.9
1933	2.6	7.2	−4.6
1934	4.9	7.1	−2.2
1935	6.3	7.2	−1.0
1936	6.5	7.5	−1.0
1937	7.8	7.8	..
1938	7.8	7.8	..
1939	8.3	7.8	0.5
1940	10.4	8.2	2.2
1941	11.5	9.0	2.4
1942	14.2	10.2	4.0
1943	16.3	10.9	5.2
1944	17.2	12.0	5.4
1945	15.6	12.6	3.0
1946	13.1	10.7	2.4
1947	18.9	13.0	5.8
1948	26.6	15.5	11.1
1949	27.6	17.3	10.4
1950	27.7	19.1	8.6
1951	31.6	22.0	9.5
1952	33.3	24.0	9.2
1953	34.4	26.5	7.9
1954	35.5	28.8	6.7
1955	42.0	32.0	10.1
1956	43.0	34.4	8.6
1957	45.6	37.4	8.2
1958	44.7	38.6	6.2
1959	51.3	41.0	10.3
1960	50.6	43.0	7.3
1961	50.8	44.3	6.5
1962	57.7	49.4	7.9

[a] After inventory valuation adjustment.
SOURCE: *Survey of Current Business*, July, 1963.

1. As shown in Table 13–6, we can compute it by adding the components of personal income and subtracting personal taxes. Thus, it is equal to the sum of wages, salaries, and other income received for labor, net incomes of proprietors of unincorporated business enterprises, per-

sonal rental incomes, dividends, personal interest income, and transfer payments received from government and business, minus personal taxes.

2. We can also compute it by subtracting the disposable incomes of government and business from total gross national income or product. Thus,

$$\text{Disposable personal income} = Y - T_n - S_b$$

We shall have many occasions to emphasize that by no means all of gross national income accrues to persons or households as disposable

TABLE 13–6. Personal Income and Disposable Personal Income, 1962 (in billions of dollars)

Wage and salary receipts and other labor income	$299.0
Proprietors and rental income	61.8
Dividends	16.6
Personal interest income	22.0
Transfer income	42.8
Equals: PERSONAL INCOME	442.1
Less: PERSONAL TAXES	57.7
Equals: DISPOSABLE PERSONAL INCOME	$384.4

SOURCE: *Federal Reserve Bulletin*, July, 1963, p. 1008.

personal income; some of it remains at the disposal of government and business. Business may increase personal disposable incomes at any given level of GNP by retaining less disposable income and disbursing more to households. Thus, it may retain only smaller depreciation allowances or declare more dividends and retain only a smaller part of its net earnings. And it may lower personal disposable incomes by retaining more as depreciation allowances or by retaining more of its net earnings and declaring less as dividends. The government may also raise disposable personal income at any given level of GNP by reducing personal taxes or by increasing its transfer payments to households, and it may lower disposable personal income at any given level of GNP by increasing personal taxes or by lowering its transfer payments to households.

Disposable personal income is disposed of in two ways:

1. As personal consumption expenditures, which we denote by the symbol C. This is the same C that we used in the equation showing GNP as the sum of expenditures for output. This method of disposing of disposable personal income clearly tends to maintain the circular flow of spendings for output.
2. As personal saving, which we shall denote by the symbol S_p. Personal saving is simply that part of disposable personal income that is not spent for con-

sumption. Such an act obviously does not itself create expenditures for output; it is simply "not spending" for consumption.

Since personal saving is that part of disposable personal income not spent for C, it should be obvious that total personal disposable income is equal to $C + S_p$.

Disposable Private Income

In later sections we shall find it convenient to deal with total disposable private income. This may be looked upon in two principal ways:

1. We may consider it as total GNP minus T_n. This view emphasizes the fact that at any given level of GNP, the government may increase disposable private income by reducing T_n, either by lowering its tax collections or by raising its transfer payments. Or it may lower total disposable private income by increasing T_n, either by raising its tax collections or by reducing its transfer payments.
2. It may be the sum of disposable business income (S_b) and disposable personal income ($C + S_p$).

A close study of Table 13–7 reveals several facts about the behavior of private disposable income in recent years, which will be relevant to our later analysis.

1. About 86 to 88 percent of total private disposable income accrues to households; the other 12 to 14 percent remains with business as gross business saving.
2. Households use about 92 to 94 percent of their disposable income for consumption and about 6 to 8 percent for personal saving. Moreover, it appears that when households enjoy an increase in disposable income, they generally use a major part of it to increase their consumption and a small part to increase their rate of saving. And when they suffer a decline of disposable income, they reduce both their consumption and their saving. In the face of very large decreases in income, such as those in the early 1930s, personal saving can become negative.
3. Total private gross saving is equal to about 18 to 20 percent of total private disposable income. Well over half of this is in the form of gross business saving.

Summary

We can now trace out in a general way the processes involved in the circular flow of income. We start with some rate of money income creation or expenditures for output composed of $C + I + G$. Some of these expenditures for output are claimed directly by government in the form of indirect business taxes. All the remainder is claimed initially by

TABLE 13-7. Disposable Private Income and Its Disposal, 1929–1962
(in billions of dollars)

Year	Disposable Private Income	Disposable Personal Income	Personal Consumption	Personal Saving	Gross Business Saving (Disposable Business Income)	Total Private Gross Saving
1929	$ 94.6	$ 83.1	$ 79.0	$ 4.2	$11.5	$15.7
1930	83.2	74.4	71.0	3.4	8.8	12.2
1931	69.0	63.8	61.3	2.5	5.2	7.7
1932	51.4	48.7	49.3	−0.6	2.7	2.0
1933	48.3	45.7	46.4	−0.6	2.6	1.9
1934	56.9	52.0	51.9	..	4.9	5.0
1935	64.5	58.3	56.3	2.0	6.3	8.4
1936	72.8	66.2	62.6	3.6	6.5	10.1
1937	78.7	71.0	67.3	3.7	7.8	11.5
1938	73.5	65.7	64.6	1.0	7.8	8.9
1939	78.7	70.4	67.6	2.9	8.3	11.2
1940	86.4	76.1	71.9	4.2	10.4	14.6
1941	105.4	93.0	81.9	11.1	11.5	22.6
1942	131.6	117.5	89.7	27.8	14.2	41.9
1943	149.6	133.5	100.5	33.0	16.3	49.3
1944	164.2	146.8	109.8	36.9	17.2	54.2
1945	165.9	150.4	121.7	28.7	15.6	44.3
1946	173.7	160.6	147.1	13.5	13.1	26.6
1947	189.0	170.1	165.4	4.7	18.9	23.6
1948	215.9	189.3	178.3	11.0	26.6	37.6
1949	216.3	189.7	181.2	8.5	27.6	36.1
1950	235.4	207.7	195.0	12.6	27.7	40.3
1951	259.1	227.5	209.8	17.7	31.6	49.3
1952	272.0	238.7	219.8	18.9	33.3	52.2
1953	286.9	252.5	232.6	19.8	34.4	54.2
1954	292.4	256.9	238.0	18.9	35.5	54.4
1955	316.4	274.4	256.9	17.5	42.0	59.5
1956	335.9	292.9	269.9	23.0	43.0	66.0
1957	354.4	308.8	285.2	23.6	45.6	69.2
1958	362.6	317.9	293.2	24.7	44.7	69.4
1959	388.4	337.1	313.5	23.6	51.3	74.9
1960	400.5	349.9	328.2	21.7	50.6	72.3
1961	415.2	364.4	336.8	27.6	50.8	78.4
1962	442.1	384.4	355.4	29.1	57.7	86.8

business and households. However, the government extracts large amounts from private incomes through tax collections, T. Then it returns some of these funds to the private sectors through domestic transfer payments, P_d. The remainder, T_n, is the government's disposable income.

The government can reinject these net receipts into the spending stream by purchasing goods and services, G. If G is exactly equal to T_n, the government itself does nothing to change the rate of flow of income. If G is greater than T_n, the government tends to make a net contribution to the flow of income. But if G is less than T_n, so that S_g is positive, the government fails by that amount to reinject into the income stream as much as it received from that stream.

A major part of $C + I + G$ accrues initially to business firms as receipts for output. A large part of these receipts must then be transferred to the government and household sectors. Taxes must be paid to the government. Much larger amounts must be paid to households as compensation for labor, interest, rentals, dividends, and other distributed profits. However, business does retain at its disposal considerable amounts in the form of capital consumption allowances and retained net earnings. These are gross business saving, S_b. They are a part of the gross national income that is not returned as spending for output in the form of consumption.

Members of households receive a large part of total expenditures for output as compensation for their labor and for use of their property, and they also receive transfer payments from government and business. Out of this they must meet their personal tax liabilities; the remainder is personal disposable income. A large part of this is reinjected into the spending stream as consumption expenditures, C. However, the remaining part used for personal saving, S_p, is not so reinjected.

We find, then, that the circular flow of income and the level of demand for output tend to be maintained to the extent that disposable income receipts are spent as G and C. But what about the amounts used for government saving (S_g), business saving (S_b), and personal saving (S_p)? They represent shares of income not spent for these purposes. Viewed alone, the act of saving, or not spending, tends to shrink the circular flow of income and to lower demands for output.

We shall use the symbol S to designate total gross saving. S may be viewed in two ways, which amount to the same thing:

$$S = S_p + S_b + S_g$$

or

$$S = Y - C - G$$

SAVING AND INVESTMENT

By now we should begin to suspect that processes of saving and investment play crucial roles in the circular flow of income and in determining the level, and changes in the level, of GNP. Saving is a necessary condi-

tion for gross investment, using the latter term to mean gross private domestic investment plus net exports of goods and services. If the nation used the entire value of its output for consumption and to supply goods and services to the government, no output and no productive factors would be available for these investment purposes. Saving serves to make available a part of output, or potential output, for investment use. But "not spending" for consumption and government use does not assure that the potential output so released will actually be used for investment. The result can be merely a decline in the demand for output and a decrease in actual output and employment. Saving can be "offset," demands for output sustained, and acts of saving converted into actual investment only to the extent that there are demands for output to be used for gross investment. Thus, actual investment requires not only a willingness of the nation to save some part of its income and output, but also the enterprise and courage to spend for investment purposes.

Table 13–8 shows the behavior of gross saving and gross investment during recent decades. Note that these are merely ex post accounting figures; that is, they show what did, in fact, result, but not how or why. A close study of the data for each year reveals something that may at first seem surprising: In every year, total gross saving was exactly equal to total gross investment in the form of gross private investment and net exports. This was true when GNP was very low and also when it was very high. In fact, there is nothing remarkable about the ex post equality of S and I. It follows from our national income accounting. We saw that, in terms of income created during any stated period, and therefore the amount of income available for disposal,

$$Y = C + I + G$$

In terms of the disposal of that income,

$$Y = C + S_p + S_b + G + S_g$$

Subtracting C and G from both equations, we get

$$I = S_p + S_b + S_g$$

or

$$I = S$$

In later chapters dealing with national income analysis, we shall find more interesting reasons for this ex post equality of S and I and also a description of the processes of equalization. For example, we shall find that changes in the level of income are a principal method of bringing S and I into equality. If, starting from some level of Y, the community tries to save more than is currently being spent for investment, Y will fall and lower the amount actually saved. On the other hand, if invest-

TABLE 13–8. U.S. Gross Saving and Offsets to Saving, 1929–1962
(in billions of dollars)

	Supply of Saving				Offsets to Saving			Col. A — Col. B, Statistical Discrepancy
Year	Personal Saving (S_p)	Gross Business Saving (S_b)	Government Saving (S_g)	Col. A, Total Saving (S)	Gross Private Domestic Investment	Net Exports of Goods and Services	Col. B, Total Offsets to Saving	
1929	$ 4.2	$11.5	$ 1.0	$16.7	$16.2	$0.8	$17.0	−0.3
1930	3.4	8.8	− 0.3	11.9	10.3	0.7	11.0	0.9
1931	2.5	5.2	− 2.8	4.9	5.5	0.2	5.7	−0.8
1932	− 0.6	2.7	− 1.7	.4	0.9	0.2	1.1	−0.7
1933	− 0.6	2.6	− 1.4	.6	1.4	0.2	1.6	−1.0
1934	..	4.9	− 2.4	2.5	2.9	0.4	3.3	−0.8
1935	2.0	6.3	− 2.0	6.3	6.3	..	6.3	0.0
1936	3.6	6.5	− 3.0	7.1	8.4	..	8.4	−1.3
1937	3.7	7.8	0.6	10.9	11.7	..	11.7	−0.8
1938	1.0	7.8	− 1.6	7.2	6.7	1.1	7.8	−0.6
1939	2.9	8.3	− 2.1	9.1	9.3	0.9	10.2	−1.1
1940	4.2	10.4	− 0.7	13.9	13.2	1.5	14.7	−0.8
1941	11.1	11.5	− 3.8	18.8	18.1	1.1	19.2	−0.4
1942	27.8	14.2	− 31.8	10.2	9.9	− 0.2	9.7	0.5
1943	33.0	16.3	− 44.2	5.1	5.6	− 2.2	3.4	1.7
1944	36.9	17.2	− 51.9	2.2	7.1	− 2.1	5.0	−2.8
1945	28.7	15.6	− 39.7	4.6	10.4	− 1.4	9.0	−4.4
1946	13.5	13.0	4.1	30.6	28.1	4.9	33.0	−2.4
1947	4.7	18.9	13.4	37.0	31.5	9.0	40.5	−3.5
1948	11.0	26.6	9.8	47.4	43.1	3.5	46.6	0.8
1949	8.5	27.6	0.1	36.2	33.0	3.8	36.8	−0.6
1950	12.6	27.7	11.0	50.3	50.0	0.6	50.6	−0.3
1951	17.7	31.6	8.3	57.6	56.3	2.4	58.7	−1.1
1952	18.9	33.3	− 2.3	49.9	49.9	1.3	51.2	−1.3
1953	19.8	34.4	− 5.5	48.7	50.3	− 0.4	49.9	−1.2
1954	18.9	35.5	− 5.4	49.0	48.9	1.0	49.9	−0.9
1955	17.5	42.0	4.4	63.9	63.8	1.1	64.9	−1.0
1956	23.0	43.0	6.6	72.6	67.4	4.9	71.0	−0.6
1957	23.6	45.6	2.4	71.6	66.1	2.9	70.3	2.3
1958	24.7	44.7	− 10.2	59.2	56.6	1.2	57.8	1.4
1959	23.6	51.3	− 0.1	74.8	72.7	− 0.8	71.9	2.9
1960	21.7	50.6	5.5	77.8	71.8	3.0	74.8	3.0
1961	27.6	50.8	− 3.1	75.3	69.0	4.5	73.5	1.8
1962	29.1	57.7	− 2.5	84.3	78.8	3.8	82.6	1.7

SOURCE: *Survey of Current Business*, July, 1963.

ment demand for output exceeds the supply of saving at an existing level of income, Y will rise and elicit increased amounts of saving. This will be elaborated later.

SUMMARY AND CONCLUSIONS

This chapter has concerned itself largely with what is usually called "national income accounting," showing the nature of national income (in this case GNP), the components of GNP, and some of their relationships to the total and to each other. It has dealt little with "national income analysis," by which we mean the determination of the level of national income at any time and of its fluctuations through time. For example, it did not consider such questions as these: "Why was Y, at a particular time, where it was rather than higher or lower? Why and through what processes did it change from one level to another?" Such questions will be discussed later.

Nevertheless, we have made many useful discoveries:

1. Expenditures for output, and only expenditures for output, create money income for the nation. Money income must, therefore, vary with the level of expenditures.
2. The income flow is a circular flow involving flows of expenditures into the market for output, into income receipts, back again into the market for output, and so on.
3. In this process, saving and investment play crucial roles. Saving can be reinjected as spending for output only through investment spending. However, government dissaving is comparable to investment as an offset to private saving. Private saving can be reinjected into demand for output, by government purchases in excess of its disposable income.
4. During any period, the nation as a whole can succeed in saving only an amount just equal to investment expenditures for output.
5. The government can directly affect the flow of incomes by altering its rate of expenditures for output, the amount of its tax collection at each level of Y, and its rate of transfer payments.

14. Quantity-Theory Approaches

We are now ready to begin an extended study of theories concerning the relationships of money with other economic variables. We shall be especially interested in such variables as the rate of real output, the price level of output, the level of money income, and interest rates. We shall rarely deal explicitly with levels of employment and unemployment, though it should be remembered that these are closely related to the rate of real output, especially in the short run. We shall find it convenient to employ some of the symbols used earlier:[1]

O = real output, stated at an annual rate
P = the price level, expressed as the average price per unit of output
Y = the money value of output = GNP = PO
R = "the interest rate," a proxy for the height of the structure of interest rates
M = the supply or stock of money

The analysis that we shall develop in the succeeding chapters is a synthesis of two branches of monetary theory, both of which have very long histories. One is a quantity theory approach, stated in terms of the supply of money and the demand for money balances. The other may be called an "income approach," couched in terms of consumption, saving, and investment. We shall argue that the equilibrium levels of real output, prices, money income, and interest rates are determined simultaneously by four functions:

1. Supply function of money
2. Demand function for money balances
3. Supply function of saving
4. Investment demand function for output.

These four are analogous to the demand and supply functions considered in Chapter 12. Note that income, prices, and interest rates are not determined independently of each other; they are determined simul-

[1] For more precise definitions of O, P, and OP, see footnote 2 on p. 273.

taneously. Moreover, they are determined not by any one or two of the functions alone, but by all four together. Equilibrium can exist only if two conditions are met simultaneously: The demand for money balances is exactly equal to the money supply, and investment demand is exactly equal to the supply of saving. Thus, the equilibrium levels of income, prices, and interest rates at any time are determined by the four functions. And their equilibrium levels can be shifted by shifts of any one or more of the functions.

We shall begin by considering a quantity theory approach.

NATURE OF QUANTITY THEORIES

Quantity theories of money, which have existed in one form or another for centuries, were originally developed to explain relationships between the quantity of money and price levels, or the purchasing power of each monetary unit. Some economists limited themselves to analyzing the effects of the money supply on the behavior of price levels. Others attempted to analyze all the forces determining price level behavior. However, later versions of the quantity theory aimed at explaining relationships between the money supply and the flow of expenditures for output, or the level of national money income.

It is not true, as some critics have alleged, that most quantity theories assert that the price level depends solely on the money supply and varies proportionally with the money supply. Many do argue, using standard demand and supply analysis, that increases or decreases in the money supply will bring approximately proportional changes in price levels, *other things being equal.* But they recognize that other things may not remain equal, and that these changes require analysis. For example, they recognize that the rate of flow of expenditures for output sometimes fails to remain a constant multiple of the stock of money. Y/M can vary. One of the major tasks of quantity theories is to analyze and explain the relationship between the stock of money and the flow of expenditures. Moreover, these theories recognize that changes in the rate of expenditures, or in the effective money demand for output, need not bring proportional changes in prices if such changes of demand are accompanied by changes in the supply of goods and services. For example, prices need not rise, or at least not rise proportionally, if increases of demand elicit increases in the supply of things available for purchase. And prices need not fall proportionally if decreases of demand decrease the supply of available goods and services. To infer that quantity theorists did not recognize and attempt to explain these problems is to underestimate the sophistica-

tion of a long line of able economists. Of course this is not to say that we now find these theories fully satisfactory.

As already indicated, one of the crucial tasks of monetary theory is to explain relationships between the stock of money and the rate of flow of money expenditures. This clearly depends on choices and decisions by the members of the community, for all are free to hold balances idle, to spend them away slowly or quickly, and to change their rates of expenditures from one period to another. Quantity theorists have used two principal approaches to this problem. Members of one group, most prominent in the United States, employ what may be called a *velocity approach*. They concentrate on $Y/M = V$. In this case, V is the income velocity of money, the average number of times each dollar of the money supply is spent for output during a year. They then try to analyze and explain the behavior of V by considering institutional arrangements and other forces influencing the community's choices and decisions concerning its rate of expenditures relative to its stock of money.

The other principal approach, developed largely in England and on the Continent, is called the *cash balance* or "demand for money balances" approach. It concentrates on the relationship $M/Y = K$, and attempts to analyze and explain the amounts of money balances demanded by the community in relation to its annual rate of expenditures. K expresses the community's demand for money balances as a fraction of its rate of expenditures.

The two approaches need not lead to different conclusions. Mathematically, of course, $V = 1/K$, and $K = 1/V$. For example, if $Y = 4M$, then $M = \frac{1}{4}Y$. More importantly, the two approaches can be analytically the same. The same forces that determine the behavior of V determine the behavior of K. We shall use a variant of the cash balance (or demand for money balances) approach solely because it seems to be a better expository device for analyzing the community's choices between spending and holding money.

Our analysis will concentrate on two functions: the money supply function and the demand money-balances function. We shall argue that the rate of expenditures, or effective money demand for output, can be in equilibrium only when the demand for money balances is exactly equal to the supply of money available for holding. If their actual balances, which are determined by the money supply, are in excess of their demanded balances, members of the community will try to get rid of the excess by increasing their rate of expenditures for other things. If their actual balances are below the demanded level, they try to repair the deficiency by decreasing their rate of expenditures. We shall now

broaden and deepen this analysis, investigating the motives for holding and not holding money and looking at some of the factors that determine the quantities of money balances demanded.

Until further notice we shall assume, as did most of the earlier quantity theorists, that the quantities of money balances demanded are not influenced to any significant extent by the height of interest rates. The importance of this assumption will become apparent later.

SUPPLY OF MONEY

Having discussed this at length in earlier sections, we can deal with it summarily here. It will be sufficient to note that the supply of money is the stock of things generally accepted as a medium of exchange, and that we assume in this section that the monetary authority adamantly keeps this stock at a fixed quantity. It successfully prevents the supply of money from rising or falling in response to increases or decreases in the demand for it. Other types of money-supply functions and shifts in the supply of money will be discussed later.

One consequence of this assumption of a rigidly controlled money supply should be noted. If the quantity of money available for holding (M) does not change, the demand for money must be brought into equality with the supply through adjustments in the quantities demanded. Excesses of the supply of money over the demand for it must be eradicated by increases in the quantity of money demanded. And excesses in the quantity demanded over the available supply of money must be corrected by some sort of development lowering the quantity demanded.

DEMAND FOR MONEY

The theory of the demand for money balances is best viewed as but one part of the theory of choice in the allocation of scarce resources. Each member of the community has at his command only limited resources in the form of current income and total accumulated assets. He must therefore make choices concerning their allocation. If he chooses more consumption, he must hold fewer total assets. And, if he chooses to hold more of one type of assets, he must hold less of others. He must constantly balance the advantage of holding more of one against the disadvantage of holding less of others. Putting the matter this way raises the question of why people elect to hold any money balances at all. Money usually yields no explicit income, or at most, only a low rate of return

relative to yields on other assets. But holding money costs something; the cost is the satisfaction or income foregone by holding money rather than devoting this amount of resources to other uses.

The fact that people do choose to hold some money balances at the cost of attractive alternatives suggests that holding money must yield some sort of utility, satisfaction, or advantage. It does, and these result from the qualities of money: its general acceptability in payments, its perfect liquidity, and its safety in the sense that it does not depreciate in terms of money. However, for each individual or business firm, money balances, as are most other goods, are subject to the law of diminishing marginal utility. Some amount of money balances is highly advantageous. But beyond some point, further additions to money balances yield only decreasing advantages per dollar. This helps explain why people elect to hold some balances, but do not hold all their assets in this form. We shall now investigate some of the reasons for holding money.

As a first step, we shall divide the total demand for money, which we shall denote by L, into two parts. One part is the transactions demand for money, which we shall call L_1. This is the demand for money to be used as a means of payments—to purchase goods and services, and so on. These are sometimes called *active balances* because they flit from payer to payee. The other part may be called the *store of value demand*, for it is the demand for money not for the purpose of making payments but as a form of holding wealth or assets. We shall call this the L_2 demand for money. These are sometimes called *idle* or *inactive* balances. This does not mean that they are performing no function; they are meeting the community's demand for assets in the form of money. But the dollars in these balances are "inactive" in the sense that they are not serving as a means of payment; they are not being spent. The total demand for money is the sum of the L_1 and L_2 demands. That is,

$$L = L_1 + L_2$$

Let us look at these in turn.

The Transactions Demand for Money, L_1

We may assume that both households and business firms arrive at their decisions concerning the size of their money balances for transactions purposes by balancing, in at least a rough way, the benefits and costs of holding the various possible amounts of money relative to their rate of expenditures. The benefits are those of a medium of payments; that is, the possession of something that remains fixed in terms of the monetary unit in which most contracts are stated and that will be ac-

cepted by almost everyone at face value in payment of debts and in the purchase of goods and services. But holding money costs something—the foregone pleasure of consuming immediately the goods or services that the money balances could be used to buy, or interest on outstanding debt that the money balance might be used to retire, or the forgone income on earning assets that could be purchased by getting rid of the money. Though the calculus lacks precision in many cases, each money-holding unit seeks to avoid holding money whose benefits are less than the costs involved, and it seeks to add to its balances when the addition is expected to yield greater benefits than costs.

Households and business firms hold money balances for transactions purposes because they think they will, or may, want to make expenditures before they enjoy a sufficient inflow of money receipts. They might hold little or no money if they were assured that money would flow to them in sufficient volume just a moment before they wanted to spend. But they usually have no such assurance. Therefore, they elect to hold some money to cover the excess of their expenditures over their receipts during some period. This is true even if they can forecast perfectly and confidently both the amounts and timing of their expenditures and receipts. For example, a household may know exactly what it is going to spend during the remainder of the month, but also that it will receive no further income until the end of the month. Or a business firm may forecast perfectly both its flow of cash receipts and its flow of expenditures, but know that for some time its expenditures will exceed its receipts. However, forecasts of cash receipts and expenditures can rarely be made with such precision and confidence. Expected receipts may fail to materialize, or highly important expenditures may be earlier or larger than anticipated, or unusually attractive bargains may become available. Some money balances are held against such contingencies.

The transactions demand for money is not made up solely of balances held for the purpose of spending for output at its final stage of sale in the form of *C*, *I*, and *G*. It includes balances held to make payments for things that do not enter into Y at all: for such things as land, existing buildings and second-hand goods, payments in the various intermediate stages of production and distribution, payments in the form of wages, interest, dividends, and so on. This does not, however, prevent our relating the transactions demand for money to the level of Y. We take account of these other payments by noting that their existence leads the demand for money at any given level of Y to be higher than it would be in their absence. Moreover, a rise or fall of these transactions can increase or decrease the demand for transactions balances at each level of Y. In

general, however, the volume of these other payments tends to move parallel with Y.

The quantities of money balances demanded for transactions purposes varies with:

1. The money value of Y; note that Y is real output times the average price of output. It will be useful to remember that a rise or fall of prices tends, by raising or lowering the money value of transactions payments, to increase or decrease the quantity of money demanded. That the community's demand for money balances tends to vary with the money value of its income transactions is plausible. For example, a household is likely to want to hold larger money balances when its expenditures for output are at an annual rate of $5000 than when these expenditures are lower. This is also the case with business firms; their demanded money balances are likely to vary with the size of their payrolls, their rate of expenditures for raw materials, components, fuels, new capital goods, and so on.

2. Another consideration is the quantity of money balances demanded for transactions purposes at any given level of Y, this quantity being stated as a fraction of Y. We shall call this fraction j; it is L_1/Y. For example, it may be $1/5$, indicating that at each point in time, the members of the community, in the aggregate, demand transactions balances equal to $1/5$ of their annual rate of expenditures for output. The quantities of these balances actually demanded (L_1) is therefore $L_1 = Y \times (L_1/Y)$, or $L_1 = j \times Y$. For example, if $Y = \$450$ billion and $L_1/Y = 1/5$, $L_1 = \$90$ billion. When we state the transactions demand for money as a function of the level of Y, we must assume that other conditions affecting this demand for money are given and constant so that we can isolate the effects of changes of Y on the quantities of money demanded. Let us now investigate some of the principal factors that determine the size of j, or L_1/Y, at any time and that are capable of increasing or decreasing it.

Determinants of the Size of j

Table 14–1 lists some of the principal factors that determine the size of the L_1/Y that the members of a community will consider most advantageous, considering both benefits and costs.

In general j tends to be smaller as the length of the period between income receipts is shortened. To illustrate this, let us consider a family that holds both its money income receipts and its expenditures at a constant rate of $7200 a year, and spends its income at a constant rate of $20 a day. (We neglect here the other five days of the year; they would complicate our arithmetic.)

TABLE 14–1. Some Determinants of L_1/Y, or j[a]

I. The system of payments in the community:
  1. Frequency of receipts and payments
  2. Regularity of money receipts and disbursements
  3. Ease and certainty of securing credit
  4. Extent of barter
II. Number of times that currently produced goods and services are sold for money in the of production and distribution
III. Value of transactions in goods other than those included in current output
IV. Rapidity of transportation of money
V. State of the community's expectations:
  1. As to the future money incomes
  2. As to the future prices of commodities and services

[a] For many of these points, see Irving Fisher, *The Purchasing Power of Money*, New York, Macmillan, 1926, pp. 79–89. Professor Fisher's analysis is aimed at explaining the velocity of money.

1. Suppose the family receives all its income at the beginning of the year, that its money balance is $7200 just after it receives its income, and that its balance is zero at the end of the year. Its average transactions balance during the year is $3600 and its j is 3600/7200, or ½.

2. Suppose it receives $600 at the beginning of each month and spends all of it during the month. Its average balance will be $300 and its j will be 300/7200, or $1/24$. Shortening the income period to a week would reduce j still further.

We find, then, that one important determinant of the size of j is the length of the average income period in the community.

Another determinant is the regularity of receipts and disbursements. If people and business firms receive predictably stable amounts of money at regular intervals, they are likely to feel free to spend most of it before the next date on which they are to receive money. But if receipts are highly unstable and unpredictable, they are likely to feel a need to hold more money to tide them over lean periods.

The size of j also depends in part on the ease and certainty of securing credit. If credit were unavailable, or were available only uncertainly and on onerous terms, both households and business firms would find it advantageous to hold large money balances relative to their expenditures. But if financial institutions and the use of credit are highly developed, the community may elect to hold smaller transactions balances relative to expenditures. Consumers need not accumulate large balances to pay for an expensive item, such as a car or TV set; they buy it "on credit" and pay so much each payday. They need not hold balances to cover their

expenditures between paydays; they "charge it" and pay when they receive income. This also applies to business; it need not hold so much money relative to its expenditures if it is assured of credit to meet excesses of expenditures over receipts.

A widespread use of barter tends to decrease the quantity of transactions balances demanded relative to the value of output. When goods and services are bartered directly for each other, less money is needed. But as barter declines and the economy becomes more and more a "money economy," the transactions need for money tends to rise relative to the value of output. Changes in this factor are usually small in the short run, but may be important over longer periods of economic development.

The greater the number of times that currently produced goods and services are sold for money in the process of production and distribution, the larger is j likely to be. Suppose, for example, that in producing a certain product, all the processes of producing the raw material, fabricating, jobbing, wholesaling, and retailing are carried out by different firms, and that all payments among them are made with money. The transactions demand for money relative to the final value of output is likely to be large. But j is likely to be smaller if all these processes are combined within vertically integrated firms with no money payments among the departments of each firm.

The same principle applies to the value of transactions in goods other than those included in current output—in such things as securities, land, existing stocks of building and equipment, and so on. The larger these are, relative to Y, the larger is j likely to be.

The more rapid the transportation of money, the lower does j tend to be. For example, j may be large if money does not reach its receiver until two weeks after it left the spender; in the meantime, it is not available for respending. But j may be much smaller if money is received within a day or so and is available quickly for respending.

The size of j is also affected by the community's expectations as to the certainty and size of its future income receipts. Suppose, for example, that at some time the community comes to fear that its future income receipts will be less certain and may decline seriously. Its members may try to build up their money balances to tide them over the feared or expected lean period. But if they come to believe that the flow of income receipts will rise markedly in the future, they may decrease their money holdings relative to their current rate of expenditure; that is, they may increase their current rate of expenditures relative to their money balances.

Expectations concerning the future behavior of prices are also relevant to the size of j. If the members of the community believe that the prices of the things they intend to buy will remain stable, that a dollar will buy in the future just what it will buy today, they may elect to hold one quantity of money relative to their expenditures. They are likely to increase j if they expect prices to fall. Both business and consumers may postpone purchases and hold larger balances relative to expenditures. They may elect to hold money, which they expect to increase in purchasing power, rather than hold inventories of goods that they expect to depreciate relative to money. They try to do this by decreasing their expenditures. Expectations of higher prices have the reverse effects; the members of the community are likely to try to hold smaller balances relative to their expenditures. They try to buy before prices rise. In hyperinflations, such as that in Germany after World War I, j falls to very low levels. When members of the community come to fear that each monetary unit will lose half or more of its purchasing power in a day or two, they try to avoid holding money. They refuse to accept money for their goods and services, resorting to barter instead, or if they sell for money, they race to get rid of it immediately.

In summary, we have noted in this section some of the more important conditions that affect the size of L_1/Y, or j. These are the conditions that we must assume to be given and constant when we state the transactions demand for money as a function of the level of Y in order to isolate the effects of changes in Y on the size of L_1. They are also the types of conditions whose changes can shift j upward and downward. It will be noted that some of these conditions reflect institutional, structural, and customary conditions that usually change only slowly. Among these are the customary length of income periods, the state of development of lending institutions and sources of credit, the extent of barter, the structure of production and distribution, the average number of times each unit of output is sold for money in the production–distribution process, and the rapidity of transportation of money. The relative stability of these factors in the short run tends to make j stable. But some of the conditions, such as expectations with respect to future incomes and prices, may be unstable in the short run and can shift j upward and downward over short periods.

In the process of analyzing the determination of the size of j, we have also analyzed the determination of the income velocity of transactions balances; that is, the average number of times each dollar of these active balances is spent for Y each year. The income velocity of these active balances is simply the reciprocal of j. Whereas $j = L_1/Y$, the income

velocity of the balances represented by L_1 is Y/L_1. Some economists prefer to analyze L_1/Y, noting the way in which the community adjusts its rate of expenditures to achieve the desired ratio. Others prefer to analyze the same problem by using the reciprocal ratio Y/L_1. Both are, of course, essentially the same theory, paying attention to the same sets of conditions, and using essentially the same line of reasoning. In our later analysis, it will be useful to remember that the income velocity of transactions balances is the reciprocal of j. Thus, if $j = 1/5$, it is 5. If $j = 1/3$, the reciprocal is 3.

Store of Value Demand for Money, L_2

We now turn our attention to money balances demanded, not for purposes of spending in the regular course of business or household operations, but as a store of value, as a form for holding wealth or assets. Money is not, of course, the only form in which assets can be held. Assets of many forms are available: ownership claims against real estate, durable equipment, and all other forms of physical goods; shares of stock in corporations; debt claims against governmental units, business firms, and individuals; claims against savings banks and savings and loan associations; and so on. The members of the community presumably determine how much money they will hold as a store of value by comparing the benefits and costs of holding money as compared with other assets. As an asset, money has certain advantages that other assets lack in some degree. It is perfectly safe in the sense that it remains at face value and does not depreciate in terms of the monetary unit. It is perfectly liquid; it is the only asset that is itself generally acceptable at face value in payment of debt or in the purchase of goods and services without the inconvenience and cost of first being sold for money. But holding money costs something, for money itself ordinarily yields no income other than the convenience, safety, and liquidity that it bears. Households and business firms presumably balance these types of benefits and costs in determining what part of their total assets to hold in the form of money and what part in other forms.

At this point, we shall state the store of value (or L_2) demand for money as a function of the community's total wealth and also as a function of the fraction of that wealth that the community elects to hold in the form of money balances. We shall use W to designate the money value of the total wealth of the community. This is equal to the total real assets of the community (A) times the average price per unit of assets, (P). We shall use b to designate the fraction of its total wealth that the community demands to hold in the form of L_2 balances. Thus,

$b = L_2/W$, or L_2/AP; and $L_2 = bW$, or bAP. We shall later emphasize that the higher the price level of the community's assets, the greater is likely to be the quantity of L_2 balances demanded.

Other things being equal, the richer a nation is in terms of the total money value of its wealth or assets, the higher is likely to be the amount of money that it will elect to hold as an asset. This is not to say that because it is richer, it will hold a larger part of its assets in money—only that it will tend to demand a larger absolute amount of money for holding as an asset.

The size of b, the fraction of its total wealth that the community elects to hold in the form of L_2 balances, depends on many things, but especially on the variety and characteristics of the other assets available for holding. Imagine, for example, a community that has available for holding only money and ownership claims against physical wealth, and that because there is no efficient market mechanism for buying and selling ownership claims, they are highly illiquid, and the net prices at which they can be sold are highly uncertain. Under such conditions, b is likely to be rather large; the community is likely to elect to hold a rather large fraction of its total wealth in the form of money balances. Suppose now that the community develops highly efficient securities markets to permit these claims to be sold quickly and at low cost. (1) It creates a wide variety of securities ranging from those that are relatively illiquid and risky, but which offer prospects of high returns, to those that are highly safe and liquid, but which offer lower (but still positive) returns. (2) It develops and popularizes new types of institutions, such as savings banks and savings and loan associations, that create claims against themselves and thus offer a degree of safety and liquidity approaching that of money itself. The community may reach a stage, such as now prevails in the United States, at which potential holders of assets can choose among money balances, physical assets, a wide variety of long term securities, Treasury bills, and other liquid short-term claims against government, a variety of relatively liquid claims against private debtors, and savings-account claims against commercial banks, mutual savings banks, saving and loan associations, and credit unions. Faced with such a volume and variety of attractive "money substitutes," the community is almost certain to elect to hold in the form of money balances a smaller fraction of its total wealth. Such important financial innovations have been a potent force in reducing b, thus retarding growth of the total demand for L_2 balances as W has grown.

Expectations with respect to the future prices of other assets also affect

the size of b, and thus L_2 demands for money balances, by affecting the expected costs and benefits of holding money. Expectations of a decline in the prices of other assets increase the expected benefits from holding money; the holder of money escapes an expected decline in the money value of his assets. On the other hand, expectations of a rise in the prices of other assets increase the cost of holding money; holding money involves the sacrifice of an expected gain in the money value of other assets.

Summary: $L = L_1 + L_2$

As noted earlier, the total amount of money balances demanded (L) is equal to the amount demanded for transactions purposes (L_1) plus the amount demanded for store of value purposes (L_2):

$$\begin{aligned} L_1 &= jY, \quad \text{or } jOP \\ L_2 &= bW, \quad \text{or } bAP \\ L &= jOP + bAP \end{aligned}$$

Thus, the actual amount of money balances demanded depends on five factors: j, O, P, b, and A. Note that the third equation above can also be written as $L = P(jO + bA)$. Quantity theorists often employ equations of this general type for two reasons: (1) to emphasize that, other things equal, more money balances will be demanded at higher price levels. They stress that the community demands to hold in the form of money real purchasing power equal to some fraction j of real income or output and some fraction b of total real assets. To achieve this they will demand more money balances at higher price levels and smaller money balances at lower price levels. (2) The other reason is to isolate P as a variable, whose behavior is to be explained.

Let us now use this type of quantity theory to analyze the determination of price levels.

M, L, AND THE PRICE LEVEL

In order to concentrate on the determination of equilibrium price levels, we shall in this section assume that both the level of real income and the total stock of real assets are given and constant. For example, we assume that, valued at constant base period prices, real income is at an annual rate of \$500 billion and the stock of real assets is \$2000 billion.[2]

[2] Here, as earlier, our unit of measurement of real output and assets is a dollar's worth at base period prices. The price level, P, at any time is therefore the average dollar price per unit of output or assets.

Static Equilibrium

We shall first investigate the determination of equilibrium price levels with given and constant money supply and demand for money functions. The money supply is assumed to remain constant at $225 billion. The demand for money function is also constant, with $j = \frac{1}{5}$ and $b = \frac{1}{40}$. That is, the community demands to hold enough money balances to give it command over $\frac{1}{5}$ of its real annual income (or 100 billion units) plus $\frac{1}{40}$ of its real assets (or 50 billion units) for a total of 150 billion units. But, as shown in Table 14–2, the quantities of money that the community demands to hold depend on the height of the price level. It will demand only $75 billion if the average price per unit is only $0.50, but $375 billion is called for if the average price is $2.50. This is shown graphically in Figure 14–1.

TABLE 14–2. Demand Function for Money Balances (amounts in billions)

(Col. 1) Units of Real Output and Real Assets over Which the Community Demands Purchasing Power in the Form of Money	(Col. 2) Average Price per Unit of Output	(Col. 3) Quantities of Money Demanded (Col. 1 × Col. 2)
150	$2.50	$375
150	2.00	300
150	1.50	225
150	1.00	150
150	0.50	75

The price level is shown on the vertical axis and the quantities of money supplied and demanded on the horizontal axis. As long as the money supply and the demand for money functions remain constant, the equilibrium price level must be $P = 1.5$, for it is only at this level that the quantity of money balances demanded will be exactly equal to the actual supply. This point can be established by showing that any lower or higher price level is one of disequilibrium and will create forces tending to return prices to their equilibrium level.

Suppose that prices were at some lower level, such as $P = 1.0$. At any such lower level of prices, the quantity of money balances demanded would be smaller than the actual supply. For example, at $P = 1.0$, only $150 billion of money balances will be demanded while the actual supply

is $225 billion, leaving an excess supply of $75 billion. Members of the community will try to get rid of this excess supply by increasing their rate of expenditures for other things. These increased expenditures may flow through two types of channels:

1. Some owners of excess balances may use them directly to increase their demands for output for consumption or investment purposes. These increases of expenditures with real output constant tend to raise prices.

2. Some members with excess balances may not use them to buy output, but to demand securities and other credit instruments. They pay off some of their debts, thus putting money in the hands of former lenders, or they increase their demands for securities issued by others.

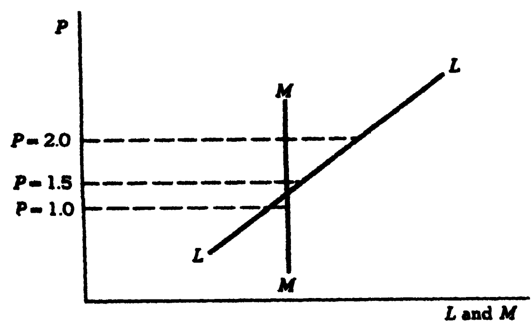

FIG. 14–1. Price Level with Given Money-Supply and Demand-for-Money Functions.

The result is an increased demand for securities, an increase in the supply of investable funds, and a tendency to lower interest rates. The greater availability and lower cost of investable funds tend to stimulate investment demand for output and also any consumer and government demands that are sensitive to the availability and cost of funds.

All these increases of expenditures in the face of a constant supply of real output serve to raise prices, and the process will continue until prices have risen enough to restore the community's demand for money balances into equality with the available supply. Note that it was the fall of prices that lowered the quantities of money balances demanded and thus created an excess supply of money, and that it was the rise of prices that again equated demand with the available supply.

Similarly, we can show that any price level above $P = 1.5$ is too high for equilibrium and will create forces that tend to lower prices. Suppose prices were at $P = 2.0$. At this price level, the community would demand

$300 billion of money balances while the actual supply was only $225 billion. The quantity of money balances demanded would exceed actual holdings by $75 billion. Members of the community would try to build up their balances by decreasing their rate of spending—by spending less than they receive from others. Some might directly decrease their demands for output for consumption or investment purposes. This obviously would tend to lower prices. Others might decrease their demand for securities or actually sell securities to build up their balances. For example, in such a situation you could use some of your current saving to add to your balances rather than lend it or buy securities, or you could sell some of your holdings of securities, or you could seek to borrow to build up your balances. In any case, the tendency would be to lower the price of securities, to decrease the supply of investable funds, and to raise interest rates. Lowered availability and increased cost of investable funds serves to decrease investment demand for output and perhaps also some sensitive consumer and government demands.

These decreases of expenditures serve to lower prices, and the process will continue until prices have fallen enough to equate the quantity of money balances demanded with the available supply.

Several points developed in this section are essential to our later analysis:

1. The rate of expenditures can be in equilibrium only if the quantity of money balances demanded is exactly equal to the supply of money. An excess of the money supply over balances demanded serves to increase expenditures, whereas an excess of demanded balances over the available supply serves to decrease expenditures.

2. When the supply of money exceeds demanded balances, some holders of excess balances may spend them directly for output. Others will seek to get rid of them by purchasing securities and lending, thereby increasing the supply of investable funds and tending to lower interest rates. We shall later emphasize that the presence of an excess supply of money over demanded balances tends to swell the volume of funds available for investment.

3. When demanded balances exceed the money supply, some who feel that their actual balances are deficient will seek to build them up by decreasing their own expenditures for output. Others will seek to do so by decreasing their lending and their demand for securities or by actually selling some of their holdings. Thus, the process of attempting to increase money balances to desired levels usually appears in financial markets in the form of a tendency toward declining security prices, decreased supplies of investable funds, and rising interest rates.

In summary, we have now seen how equilibrium levels of expenditures and prices are determined by static supply of money and demand for money functions. Let us now use comparative statics to show how equilibrium can be changed by shifts of these functions.

Shifts of the Money Supply Function

Suppose that the monetary authority increases the money supply from \$225 billion to \$300 billion, whereas the community's demand function for money balances remain constant. This is shown in Fig. 14–2 as a rightward shift from MM to $M'M'$. When the money supply was \$225 billion, it was matched by an equal demand for balances, and the rate

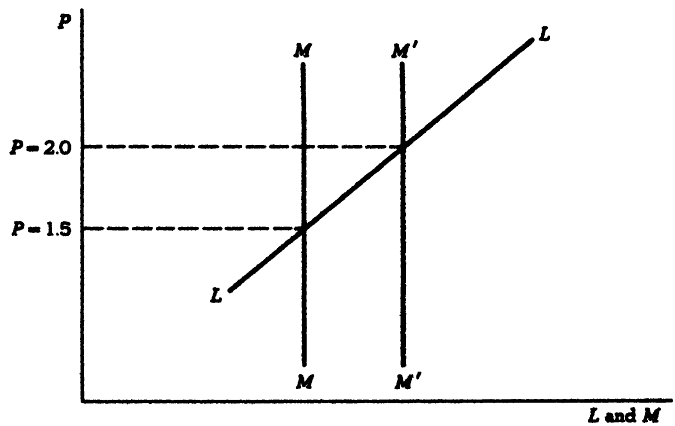

FIG. 14–2. Shifts of the Money Supply.

of expenditures and the price level were in equilibrium at $P = 1.5$. But after the increase in the money supply, this price level was no longer one of equilibrium; the supply of money exceeded demanded balances by \$75 billion. Now, endowed with more money than they want to hold under existing conditions, members of the community will seek to get rid of the excess by increasing their rate of expenditures for other things. We need not trace out this process in detail, for it has already been described. Figure 14–2 shows that the quantity of balances demanded can be brought into equality with the enlarged money supply and a new equilibrium of the rate of expenditures and level of prices will be established at $P = 2.0$. At any lower level of prices, an excess supply of money would persist; at any higher level of prices, the demand for money balances would exceed the supply.

The actual processes of injecting the increased money supply into the spending stream depend to some extent on the nature of the transactions through which the community acquires the additional money balances. Consider two cases:

1. The community receives the additional money supply in transactions that constitute an increase in its income or wealth. For example, it may get the money by gold mining, or in payment for increased exports, or as income receipts of newly created money from the government. In such cases, the community is likely to use a large part of the new money directly to increase its consumption and investment demands for output. However, to the extent that it uses some of its additional income to increase its rate of saving, it is likely to use some of the new money to increase its loans and demands for securities.

2. The community receives the extra money in transactions that do not directly increase its wealth or income. The most important examples are increased supplies of loans to private borrowers by the central and commercial banks and purchases of securities by these institutions. Members of the community who sell securities to the banks in exchange for money are no richer; they now hold more money but fewer securities. And those who borrow from the banks have more money but also more debt. Their net worth is not directly affected. There is little reason to believe that those who get money by selling securities or incurring debt to banks will feel strongly impelled to increase their consumption expenditures.

The initial impact of additional money created by expansions of bank credit is likely to fall largely on credit markets. Most of the new money will be offered initially as additional demands for securities and supplies of investable funds. However, the greater availability of funds and the fall of interest rates encourage investment spending for output and perhaps some other types of spending as well. As these increased spendings for output are received as income, large amounts of them will be respent in output markets.

We shall not consider here the case of decreases in the money supply. Readers may wish to trace out for themselves the processes through which such decreases change equilibrium levels of expenditures and prices.

Shifts of the Demand Function for Money

Equilibrium levels of expenditures and prices can be shifted by shifts of the demand functions for money balances as well as by shifts of the supply function, for they, too, can create an excess supply of money or

an excess demand for money. As used here, an increase or decrease in the demand function for money means an increase or decrease in the quantity of balances demanded at each level of prices. In Fig. 14–3, an increase is represented by a rightward shift from LL to $L'L'$, and a decrease by a leftward shift.

The demand function for money balances can be increased or decreased by increases or decreases in real income (O) or real assets (A) while j and b remain unchanged. However, we shall concentrate on changes in j and b. Changes in any of the forces listed in Table 14–1 as major determinants of j can change the amount of money balances the community demands to hold as a fraction of its annual money income.

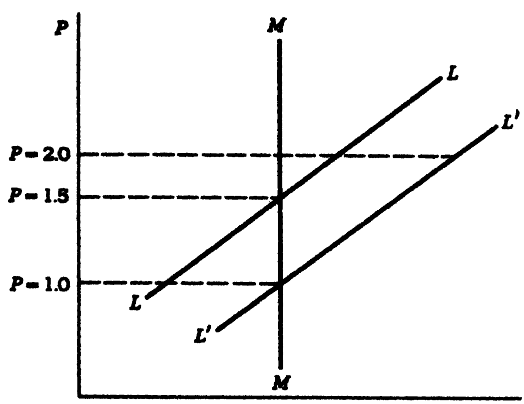

FIG. 14–3. Shifts of the Demand-for-Money Function.

For example, j can be decreased by a decrease in the average length of income periods, or by development of more reliable sources of credit, or by new expectations of larger future incomes or rising prices. Or j can be increased by such things as fears that future income receipts will dwindle or that prices will fall. Similarly, b (the fraction of its total wealth that the community elects to hold in the form of money balances) can increase or decrease. It may be decreased by such things as the development of more satisfactory money substitutes or by an expectation that other assets will rise in price. It may be increased by such things as new fears that other assets will fall in price.

Suppose that, for reasons such as those given above, the demand for money function shifts rightward from LL to $L'L'$ while the money supply remains unchanged. In the initial situation, the demand for money

was exactly equal to the available supply, and the rate of expenditures and the price level were in equilibrium with $P = 1.5$. But this is no longer an equilibrium situation after the rightward shift of the demand for money. At this old price level, the quantity of money balances demanded exceeds the available supply and members of the community will seek to build their balances up to desired levels by decreasing their expenditures for other things. Equilibrium can be re-established only at some lower price level, such as $P = 1.0$.

The reader is asked to trace through the effects of a leftward shift of the demand for money function, noting that it creates an excess supply of money and induces increases in expenditures and prices.

M, L, AND THE LEVEL OF MONEY INCOME

Let us now explore briefly how this quantity theory approach can be used to explain the behavior of the level of money expenditures for output or the level of money income. For this purpose, in Fig. 14–4 we measure along the vertical axis the level of Y, or OP. The supply of money is MM. The quantities of money demanded are expressed by the equation

$$L = jY + bAP$$

We shall deal first with the case in which the price level of the community's assets remains constant so that the quantity of money demanded for L_2 purposes is also a constant. This case is represented by the demand for money function LL.

As long as the MM and LL functions remain constant, the only equilibrium level of expenditures for output is Y_0, for only at this level will the quantity of money balances demanded be exactly equal to the available supply. At any lower level of Y, the supply of money would exceed the quantity demanded, and the community would attempt to rid itself of its excess balances by increasing its expenditures for other things, thereby raising Y. At any level of money income above Y_0, the quantities of money balances demanded would exceed the available supply, and those with deficient balances would attempt to build them up by decreasing their expenditures for other things, thereby serving to lower the level of income.

Since the logic developed in earlier sections applies fully to the determination of equilibrium levels of money income, the reader can work out the effects of increases and decreases of the money supply and of the demand for money functions.

The equilibrium level of money income that will result from any given money supply and any given values for j and b depends somewhat on the behavior of the price level of the community's assets. As noted earlier, the quantity of money demanded for L_2 purposes is equal to bAP. Thus, if the value of b and the volume of the community's real assets are given, a higher average price level of those assets will increase the size of balances demanded for L_2 purposes and leave only a smaller part of the total money supply to meet transactions demands. Thus, the equilibrium level of money income will be lower because less money is available to carry out transactions. This is illustrated in Fig. 14–4 by the demand function $L'L'$. On the other hand, lower average prices for the com-

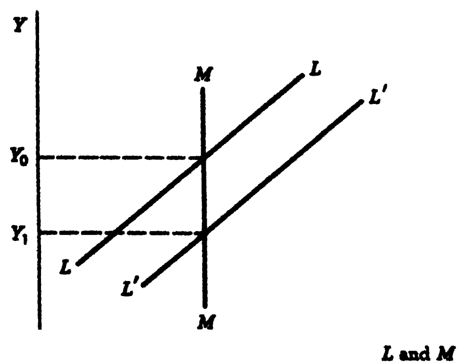

FIG. 14–4. Determination of the Level of Money Income.

munity's assets will lower L_2 demands for money, leave a larger part of the money supply available for transactions purposes, and raise the equilibrium level of money income.

Summary

We have now surveyed one type of quantity theory analysis that has been developed and used by a long line of economists. Much of the logic and many of the findings will play important roles in the type of synthetic theory to be presented later.

1. Both the supply of money and the demand for money function play important roles in determining the behavior of such variables as the rate of real output and the level of money income, price levels, and interest rates. These two functions, together with the supply of saving function

and the investment-demand function, determine the equilibrium levels of the various variables at any point in time. And shifts of these functions shift equilibrium positions of the variables.

2. A necessary condition for equilibrium is that the quantity of money balances demanded be exactly equal to the money supply. An excess of the supply over demand, or an excess of demand over supply, is necessarily a condition of disequilibrium and will induce changes in the level of expenditures.

3. Those whose actual money balances exceed the amounts they want to hold can spend away the excess for output or use it to increase their lendings and purchases of securities. The latter reacts on demands for output by increasing the availability and lowering the cost of investable funds. Processes of the opposite nature occur when actual balances are below demanded levels.

4. The L_1 and L_2 demands for money are competing demands. The amount of money available to satisfy L_1 demands is equal to $M - L_2$. Thus, a decrease in quantities demanded for L_2 purposes frees money for transactions purposes and tends to increase the rate of expenditures. An increase of quantities demanded for L_2 purposes has the reverse effects. Also, the quantity of money available to satisfy L_2 demands is equal to $M - L_1$. We shall see later that a decrease of quantities demanded for L_1 purposes tend to make more available for L_2 purposes and to lower interest rates. An increase of quantities used for L_1 has the reverse effects.

Up to this point, we have assumed—as did most of the earlier quantity theorists—that the quantities of money balances demanded are not significantly affected by the height of interest rates. As long as this assumption is maintained, quantity-theory analysis can arrive at uniquely determined levels of money expenditures and, if O and A are constant, of price levels. Important modifications are necessary if quantities of money demanded are responsive to the height of interest rates.

INTEREST RATES AND DEMANDS FOR MONEY BALANCES

Most economists now believe that the quantities of money balances demanded are significantly influenced by the height of interest rates, though there are still disagreements as to the strength of this influence. They believe that the quantities of balances demanded are negatively related to the height of interest rates (r) and that the higher the interest rate, the smaller will be the quantity of balances demanded. This prob-

ably applies to both L_1 and L_2 demands, but for purposes of exposition we shall include all interest-rate effects in the L_2 demand.

In the succeeding sections, as before, we shall assume that $L_1 = jY$. However, we must now alter our assumptions about the L_2 demand. It will be assumed that the total wealth of the community (W) is given and that the L_2 demand is a negative function of interest rates (r). That is, L_2 will be larger at lower interest rates and smaller at higher interest rates. At times, it will be convenient to measure the degree of responsiveness of L_2 to changes in interest rates. For this we shall use $\Delta L_2/\Delta r$, "the marginal responsiveness of the demand for money to interest rates." This measures the dollar amount by which a one percentage point decrease in interest rates will increase the quantities of balances demanded, and the amount by which a one percentage point increase in interest rates will decrease demanded balances.

Responsiveness of *L* to *r*

Why should L_2 be smaller at higher levels of r than at lower levels of r? We have already given one answer, noting that r is the cost of holding assets in the form of money because it is the income that is forgone if one holds money rather than spending it for other assets that would yield a rate of return equal to r. But it may be useful to look at r as the reward for holding other assets and incurring the "costs" involved therein. These "costs" are of two types. The first type is the inconvenience and out-of-pocket costs of buying, holding, servicing, and selling earning assets. The holder incurs some inconvenience and expense in acquiring the assets, in providing safekeeping for them, in collecting income and protecting his position as claimant, and in disposing of the assets if he wishes to spend. The second type of cost is in bearing the risk that the assets may decline in price. Even if these "costs" remain constant, the members of the community are likely to hold less of their assets in these other forms and more in the form of money as r falls. At lower levels of r, more people are likely to feel that the return is not sufficient to overbalance the costs, including the risk involved in acquiring and holding other assets.

The late J. M. Keynes emphasized another reason why people are likely to prefer to hold a larger part of their assets in the form of L_2 as r falls, and especially at relatively low levels of r. His point was that the lower r is, the higher will be the estimated risk that the prices of other assets will decline because of a future rise in the rate of interest. This is especially true of long-term, fixed-income assets whose prices are greatly affected by changes in interest rates. His argument ran somewhat as fol-

lows: At any given time, the community may have become accustomed to some level of long-term interest rates. If this level of rates has persisted for some time, it may come to be regarded as "natural" or "normal" in the sense that any deviation from it will be followed by a return to it. Thus, any tendency for r to fall below this level may make the community unwilling to hold other assets because they feel that any income that they receive will be more than offset by their capital losses when interest rates rise. At some level of interest rates above zero, they

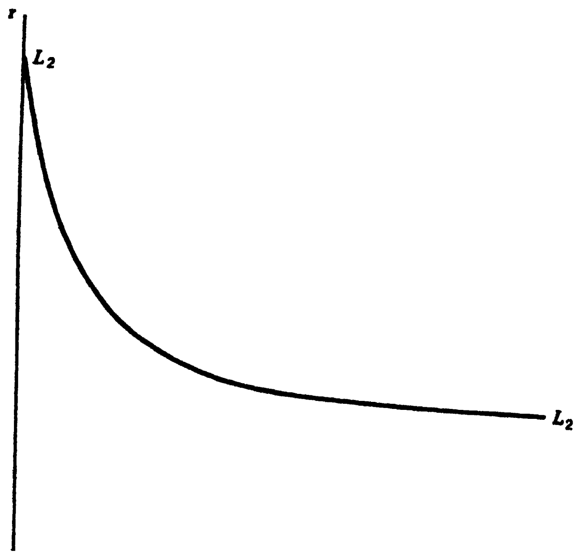

FIG. 14–5. An L_2 Demand for Money Balances.

may prefer to add indefinitely to their L_2 holdings rather than hold other assets at a lower level of r. In Fig. 14–5 this is depicted as a perfectly horizontal section of the L_2L_2 curve at some rate of interest that is low by historical standards, but still above zero. Such a curve would represent a situation in which the value of $\Delta L_2/\Delta r$ approached infinity; L_2 would be almost completely responsive to r. Keynes called this "the liquidity trap," for money would be trapped in the L_2 demand and could not lower interest rates below this level.

Such a situation, if it existed, would have serious implications for the efficacy of monetary policy. Suppose that in time of depression, the monetary authority increases the money supply in an attempt to lower

interest rates and stimulate investment demand for output. If the L_2L_2 curve is completely horizontal at the existing level of interest rates (that is, if L_2 is completely responsive to r), the increase in the money supply will not lower r at all; the community will simply add all the additional supply of money to its idle L_2 balances at the existing rate of interest. On the other hand, suppose that, at some time, the monetary authority decides to decrease the money supply in order to raise interest rates and to discourage the investment demand for output, but that the community is then holding very large L_2 balances, which are completely responsive to r at that level of r. The decrease of the money supply may neither decrease the supply of loanable funds nor raise the rate of interest; people will simply disgorge money from their L_2 balances to meet loan demands at, or close to, the prevailing rate of interest.

Many economists now believe that the point originally made by Keynes has been exaggerated by some of his followers, if not by him. In the first place, it relates largely to market rates of interest on long-term obligations. Since the prices of short-term securities are but little affected by changes in the level of interest rates, the monetary authority can force short-term rates to very low levels, though not down to zero. It can even reduce significantly the rates on medium-term securities, those with maturities up to five years or so, especially if the easy-money policy is expected to last for some time. In the second place, it is probably an exaggeration to suppose that even long-term rates cannot be reduced at all from a level closely approximating that previously prevailing. If the community comes to believe that the demand for long-term loans will for some time be small relative to the supply of loanable funds, it will revise downward its concept of a "normal" long-term rate of interest and will make loans available at lower rates. Moreover, by skillful use of moral suasion, discount rates, and open-market operations, the monetary authority may convince the community that interest rates will fall and that the wise investor will do well to lend before the rates fall further.

But however much Keynes's point may have been exaggerated, it should not be dismissed as of no importance. The marginal responsiveness of L_2 to r does pose a problem for the monetary authority. It means that a larger increase in the money supply is required to achieve any given decrease in r, if that decrease can be achieved at all. To convince the community that long-term rates will go down and stay there for some time is often a long and laborious process. In the other direction, the disgorging of money from L_2 balances in response to increases in r reduces somewhat the restrictive effects of a given decrease in the money

supply. This may, however, be less serious, for unless it is inhibited from doing so, the monetary authority may offset this by appropriately larger decreases in the money supply.

Equality of *L* and *M*

As soon as it is admitted that the quantity of money balances demanded by the community is influenced significantly by the level of interest rates, it becomes impossible to argue that the equilibrium level of expenditures for output, or of national money income, is determined solely by the supply of money and the demand function for money balances. There is no one unique level of Y at which the L and M functions will be equated. L can now be equated to M at various levels of Y together with various levels of r. This is illustrated in Table 14–3. Here

TABLE 14–3. Demand for Money as a Function of Y and r (amounts in billions)

(Col. 1) M	(Col. 2) Level of Y	(Col. 3) L_1 Demand (equals 1/5 Y)	(Col. 4) Interest Rate (in percent)	(Col. 5) L_2 Demand	(Col. 6) $L = L_1 + L_2$
\$175	\$600	\$120	5	\$ 55	\$175
175	400	80	3	95	175
175	200	40	2	135	175

it is assumed that the money supply remains constant at \$175 billion, that $L_1 = \frac{1}{5} Y$, as indicated in column 3, and that L_2 is a negative function of r, as indicated in column 5. The table indicates that $L = M$ at all the combinations shown—at a low level of income together with low interest rates and at various higher levels of income together with various higher levels of interest rates. The matter may be viewed this way: At high levels of interest rates, only smaller amounts are demanded for L_2 balances, a larger part of M is available for L_1 purposes, and L will be equal to M only at higher levels of Y. However, at lower interest rates, more is absorbed in L_2 balances, less of M is available for L_1 purposes, and L will equal M only at lower levels of Y.

This is shown graphically in Fig. 14–6. In Part B, which shows L as a function of r, each of the L curves corresponds to some income level. For example, Ly_0 is the demand for money balances with money income at the low level Y_0. The demanded balances for L_1 purposes are measured by the horizontal distance from the origin to the beginning of the curve, and the L_2 demand to the right from that point. Ly_2 is the demand for money balances with money income at the high level Y_2. It lies to the

right of the others because of the larger quantities of L_1 balances demanded at higher levels of Y. We could, if we wished, draw in L curves corresponding to all possible levels of Y.

In Part A, in which r is measured along the vertical axis and y along the horizontal axis, we plot all the combinations of y and r at which $L = M$ with a given M and a given L function. Thus the $L = M$ curve is simply the locus of all equilibrium combinations of y and r. Any combination of y and r that does not lie on this line is one of disequilibrium. For example, consider any point, such as A, which is above the $L = M$

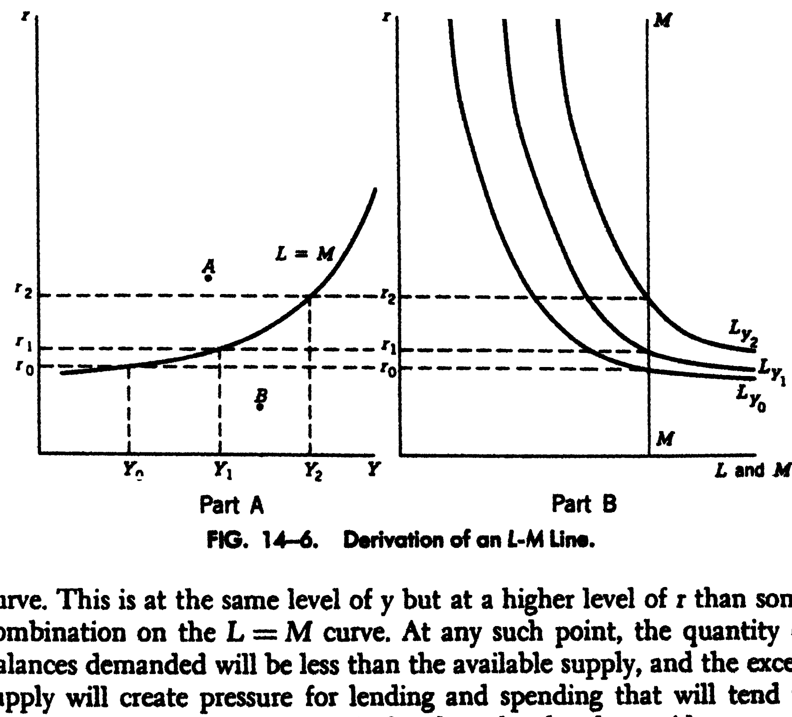

FIG. 14–6. Derivation of an L-M Line.

curve. This is at the same level of y but at a higher level of r than some combination on the $L = M$ curve. At any such point, the quantity of balances demanded will be less than the available supply, and the excess supply will create pressure for lending and spending that will tend to lower r and raise y until $L = M$. On the other hand, consider any y, r combination such as that represented by B, lying below the $L = M$ line. At any such combination, L will exceed M, and the excess demand for money balances will create pressure for an increase of r or decline of Y until $L = M$.

Thus, we find that the equilibrium positions of y and r must be somewhere on the $L = M$ line. But where? It is impossible to answer this question by considering only the supply of money and the demand for money functions when the quantities of balances demanded are signifi-

cantly influenced by the level of interest rates. We need more information, and we shall get it by analyzing supply of saving and investment-demand functions. Nor can these functions alone determine unique equilibrium points. They require the help of L and M functions.

15. Saving, Investment, and National Income

The other branch of monetary theory that will be combined in our synthesis also has a long history. Unlike quantity theories, which give the center of the stage to the supply of, and demand for, a stock of money, this branch of theory concentrates on flows—on flows of income creation, consumption, saving, and investment. Elements of it were involved in centuries-old questions such as these: Does saving enrich a nation by permitting and inducing capital formation, thereby raising production and incomes? Or does it impoverish a nation by depressing total demand for output and creating unemployment of labor and other resources? Can the market mechanism be relied upon to convert a nation's thrift into real wealth in the form of capital? Or is there a "flaw in the price system"? Is thrift a private virtue or a private vice, a national blessing or a national curse?

Elements of this approach have also played prominent roles in various types of business-cycle theory, especially those emphasizing "oversaving," "undersaving," "overinvestment," and "underinvestment." However, this type of theory remained fragmentary and unsystematic until the 1930s. It suffered from lack of national income accounts that would permit quantification of its concepts and also from lack of a comprehensive and logically consistent theory of income determination. Both lacks have now largely been remedied. Almost all countries have developed national-income accounts, varying in amount of detail and degree of reliability. And theories of national-income determination have developed rapidly, especially since the publication, in 1936, of John Maynard Keynes' monumental *General Theory of Employment, Interest, and Money*.

This type of theory usually does not attempt to explain the productive capacity of a nation at any time, nor does it explain changes in its productive capacity through time. Instead, it deals with the behavior of output and income within capacity levels; it argues that the actual level of output or income depends upon relationships between the aggregate demand function and the aggregate supply function. Increases or decreases in aggregate demand serve to raise or lower the level of output or income. In these processes, saving and investment play crucial roles.

AN OVER-ALL VIEW

A broad view of the theoretical framework that we shall develop may help to maintain perspective as we analyze the various items in detail. It will be argued that two major determinants of equilibrium levels of income and interest rates are the supply of saving function and the investment-demand function. The saving-supply function reflects those amounts of national output or income that are not used for consumption expenditures or government purchases of output. We assume that saving is a positive function of income, that more will be saved at higher levels of Y than at lower levels of Y. The investment-demand function reflects the amounts of output demanded for gross private domestic investment and for net exports of goods and services. We assume that investment is a negative function of interest rates and that the higher the interest-rate structure, the less will be spent for investment.

A necessary condition for equilibrium of income and interest rates is that investment demand be exactly equal to the supply of saving. If the supply of saving exceeds investment demand, the excess supply of output represented by the excess saving will remain unsold and will depress output and incomes. If, however, investment demand exceeds the supply of saving, the total demand for output will exceed the total supply of output, and the excess demand will serve to raise the level of income and output. Just as static investment-demand and saving-supply functions are important determinants of equilibrium levels of Y and r, so are shifts of these functions, determinants that change equilibrium levels of Y and r. The latter tend to be raised by increases of the investment-demand function or by decreases of the saving-supply function, and to be lowered by decreases of the investment-demand function or by increases of the saving-supply function.

Let us now look at these functions more closely.

SUPPLY OF SAVING FUNCTIONS

It will be useful to begin by reviewing some of our findings in Chapter 13. The amount of income created in any period is $C + I + G$:

$$(1) \qquad Y = C + I + G$$

All this value of output, no more and no less, becomes disposable income for government, business, and households. As the sum of the uses of this income,

$$(2) \qquad Y = C + S_p + S_b + G + S_g$$

The total amount of saving (S) can be expressed in two ways, but both amount to the same thing:

$$(3) \qquad S = S_p + S_b + S_g$$
$$(4) \qquad S = Y - C - G$$

We shall express S both ways, but, for some analytical purposes, the second is more useful. This is illustrated in Fig. 15–1. The amounts of income created by $C + I + G$ are indicated on the horizontal axis. The amounts of income accruing, and its uses, are measured on the vertical axis. As an expositional device, we draw a line at a 45-degree angle through the origin. If a line is dropped vertically from any point on the 45-degree line, the vertical distance to the base is exactly equal to the horizontal distance from the origin to the point of intersection. This illustrates the fact that the amount of income accruing and disposed of must be exactly equal to the amount of income created by $C + I + G$.

Note the saving-supply function represented by the curve SS. This can be arrived at in two ways. One is to measure vertically from each point on the horizontal axis the amount of saving out of that level of income. The other is to subtract vertically from each point on the 45-degree line the sum of $C + G$ at that level of income. This emphasizes that $S = Y - C - G$. It also makes clear that in our analysis, we are not ignoring C and G. To say that the nation saves a certain amount out of a given income is the same as saying that it uses the remainder for C and G. To say that it saves more at each income level is to say that at each income level, it spends less for C and G. And to say that it saves less at each income level is to say that it spends more as C and G at each income level.

As already noted, and as depicted in Fig. 15–1, the saving-supply function is assumed to be a positive function of income. It will be argued that all the components of S (that is, S_p, S_b, and S_g) tend to rise and fall with the level of income.

Government Saving, S_g

As before, T will denote the government's total tax receipts; P_D, its domestic transfer payments; T_n, its disposable income; and G, its expenditures for goods and services:

$$T_n = T - P_D$$
$$S_g = T_n - G, \quad \text{or } T - P_D - G$$

Let us first deal with a static government-saving function by assuming that the government has determined a level of G that does not change with the level of Y and that it has constant tax and transfer-payment programs which, however, are not fixed absolute amounts.

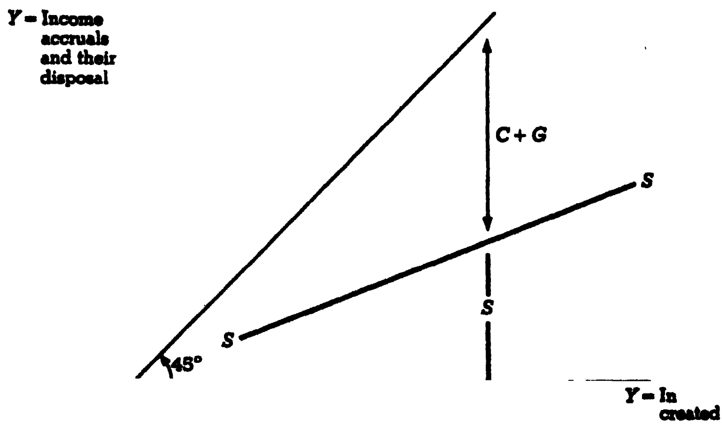

FIG. 15–1. Supply-of-Saving Function.

With G constant, S_g varies with T_n, tending to vary directly with T and inversely with P_D.

S_g is highly responsive to the level of Y, largely because actual tax yields are so responsive to changes in the level of national income. This, in turn, is largely because of the nature of our most important taxes. These are not fixed in absolute amounts; the tax laws define tax bases, or the types of things subject to tax, and prescribe tax rates applicable to these bases. For example, included in the tax base are personal incomes, corporate profits, the production or sale of commodities and services, and so on.

Thus, with no change in tax laws, a rise of Y increases tax bases and raises total tax collections. A large part of the rise of Y accrues as increased household incomes and is subject to personal income taxes. An-

other part accrues as increased corporate profits, to be taxed at the corporate income-tax rate of nearly 50 percent. Further increases in tax yields come from social security contributions, which are based on payrolls, and from taxes on production and sales. On the other hand, a decrease of Y automatically lowers total tax collections. At the effective tax rates prevailing in the early 1960s, a \$1.00 change in the level of GNP automatically changes government revenues by at least 25 cents and probably more.

The responsiveness of T_n to Y is further enhanced by the nature of some of the government's domestic transfer-payment programs. With a decline of Y reflected in lessened employment, there occur increased transfer payments in the form of unemployment compensation, relief,

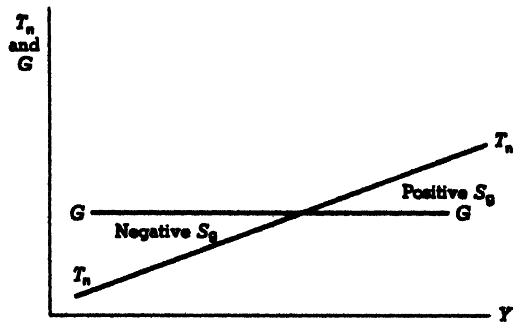

FIG. 15–2. Responsiveness of T_n to Y.

and social security payments to the elderly, who may remain at work if employment opportunities are ample but who may retire and claim their benefits if they lose their jobs. On the other hand, the amount of domestic transfer payments tends to fall as unemployment is decreased.

Thus, with a constant level of G and constant tax and domestic transfer programs, both T_n and S_g are highly responsive to Y. This is illustrated in Fig. 15–2. At some level of Y, $T_n = G$; S_g is zero. At higher levels of Y, S_g is increasingly positive. At lower levels of Y, S_g is increasingly negative. We shall later use $\Delta S_g/\Delta Y$ to measure the "marginal responsiveness of government saving to income." This reflects the fraction of any change in Y that is reflected in a change in the size of S_g. It also reflects the fraction of any change in Y that is not reflected in changes in total private disposable income.

We shall later consider cases in which the government shifts its saving-supply function. It can increase its saving at each level of Y by in-

creasing effective tax rates, by decreasing domestic transfer payments, or by decreasing G. It can lower its saving function by reducing its effective tax rates or by raising P_D or G.

Business Gross Saving, S_b

Gross business saving also tends to vary with the level of Y. Business net profits usually rise with Y and business ordinarily retains some part of the increase. On the other hand, when business profits fall with declines of Y, business usually decreases its saving in the form of undistributed profits. Capital consumption allowances are ordinarily less responsive to changes in Y. We shall use $\Delta S_b/\Delta Y$ to designate "the marginal responsiveness of gross business saving to income." This measures the fraction of any change of Y that remains at the disposal of business as a change in its rate of saving.

Personal Saving, S_p

As noted earlier, households do not enjoy as disposable income all of Y, but only that part of it not retained as disposable income by government (T_n) or by business (S_b). If we use Y_H to designate the disposable income of persons or households, then

$$Y_H = Y - T_n - S_b$$

Similarly, changes in the level of income created are reflected in changes in the disposable incomes of households (ΔY_H) only to the extent that these changes are not absorbed by changes in the government's disposable income (ΔT_n) and changes in business disposable income (ΔS_b). Thus,

$$\Delta Y_H = \Delta Y - \Delta T_n - \Delta S_b$$

or

$$\Delta Y_H = \Delta Y \left(1 - \frac{\Delta T_n}{\Delta Y} - \frac{\Delta S_b}{\Delta Y}\right)$$

Nevertheless, a major part of each increase or decrease of Y appears as an increase or decrease in personal disposable income, and both personal consumption expenditures and personal saving are responsive to these changes. We shall assume that both C and S_p are positive and relatively constant functions of current disposable income.[1]

How households divide any given level of disposable income between

[1] More complex, and perhaps more realistic, models assume that the behavior of C and S_p depend not only on current income levels, but also on such things as the expected permanence of the changed income levels, the relationship between the current income level and the highest income levels recently experienced, and the wealth and net worth positions of households. Changes in such factors can shift the consumption and personal-saving functions in our model.

consumption and saving depends on a host of economic and social conditions: on such things as attitudes toward present consumption as against provision for the future, on their responsiveness to advertisements for consumers' goods as against admonitions to save and grow rich, on the distribution of income among households that have higher and lower propensities to save, and so on. How much they will save out of a given level of Y may also depend in part on the value of assets they have already accumulated. If their assets are already very large, they may save less than they would if their accumulated assets were smaller. Thus, a great rise in stock-market prices, raising the values of outstanding claims to wealth, might increase consumption and lower saving at a given level of Y, and a sharp fall of stock prices might have the opposite effect.

How does the level of interest rates affect the supply of saving out of any given level of Y? Some economists argue that, since interest is a reward for saving, if the resulting saving is put to work, a rise of interest rates will increase the supply of saving at any level of Y, and a decline of interest rates will decrease saving and raise consumption at each level of Y. Others deny that the supply of saving is responsive to interest rates, or at least they minimize the degree of responsiveness. Some even go so far as to claim that the relationship may be the reverse; that at higher interest rates, people will save less out of a given level of Y than they would if interest rates were lower. The reason for this, they argue, is that the higher the interest rates, the less one need save in order to achieve any given level of future income. We shall not here take any position on these issues. However, in the analysis that follows, we shall assume that the supply of saving at each level of Y is not responsive to interest rates. We do this largely to avoid certain complexities that would otherwise result. But if the reader is willing to risk increased complexity, he may introduce any assumptions that he considers reasonable concerning the responsiveness of the supply of saving to interest rates.

Though the rates of personal consumption and personal saving are most directly related to the level of personal disposable income, it will facilitate our exposition to relate them to the level of total income Y: $\Delta C/\Delta Y$ = the marginal responsiveness of consumption to income and $\Delta S_p/\Delta Y$ = the marginal responsiveness of personal saving to income. Both are positive, but $\Delta C/\Delta Y$ is by far the larger fraction.[2]

[2] The marginal propensities of households to consume and to save out of personal disposable income are related in the following way to the marginal responsiveness of consumption and personal saving to Y. Let

$\dfrac{\Delta C}{\Delta Y_d}$ = marginal propensity to consume out of disposable personal income

Summary

The location of the saving-supply function depends on many things, such as the level of G, government tax and domestic transfer programs, business policies with respect to gross saving, and household attitudes toward consumption and saving. At this point, we assume that the level of G is constant and does not vary with Y and that other conditions are constant. (Upward and downward shifts of the saving-supply function will be considered later.) Given these other conditions, the supply of saving is a positive function of Y. When Y increases, some fraction of it, $\Delta C/\Delta Y$, is used to increase consumption expenditures. The remaining fraction, $1 - (\Delta C/\Delta Y)$ or $\Delta S/\Delta Y$, is used to increase saving in the form of ΔS_g, ΔS_b, and ΔS_p. When Y decreases, some fraction of it will be reflected in decreased consumption expenditures and the remainder in decreased saving. The size of the fraction $\Delta S/\Delta Y$, or $1 - (\Delta C/\Delta Y)$, will play an important role in later sections. We shall refer to $\Delta S/\Delta Y$ as "the marginal responsiveness of saving to income."

As already emphasized, the supply of saving is simply that part of national income or the value of output that is not used for C and G. Thus, saving, considered by itself, tends to lower the value of output and income. We shall now consider "offsets" to saving.

$\dfrac{\Delta S_p}{\Delta Y_d}$ = marginal propensity to save out of personal disposable income

$\dfrac{\Delta Y_d}{\Delta Y} = \left(1 - \dfrac{\Delta T_n}{\Delta Y} - \dfrac{\Delta S_b}{\Delta Y}\right)$ = the fraction of any change in the level of Y that accrues as a change in personal disposable income

Then

$$\frac{\Delta C}{\Delta Y} = \frac{\Delta C}{\Delta Y_d}\left(1 - \frac{\Delta T_n}{\Delta Y} - \frac{\Delta S_b}{\Delta Y}\right)$$

and

$$\frac{\Delta S_p}{\Delta Y} = \frac{\Delta S_p}{\Delta Y_d}\left(1 - \frac{\Delta T_n}{\Delta Y} - \frac{\Delta S_b}{\Delta Y}\right)$$

For example, suppose

$$\frac{\Delta C}{\Delta Y_d} = 0.9 \quad \text{and} \quad \left(1 - \frac{\Delta T_n}{\Delta Y} - \frac{\Delta S_b}{\Delta Y}\right) = 0.7$$

Then

$$\frac{\Delta C}{\Delta Y} = 0.9 \times 0.7 = 0.63$$

This emphasizes two points: (1) $\Delta C/\Delta Y$ is smaller than $\Delta C/\Delta Y_d$. (2) The size of $\Delta C/\Delta Y$ can be increased or decreased by anything that alters the fraction of ΔY accruing as ΔY_d. Tax and transfer policies can be used for this purpose.

INVESTMENT-DEMAND FUNCTIONS

Since the saving-supply function developed earlier related to gross saving, the investment-demand function used here will relate to gross investment, which includes gross private domestic investment and net exports of goods and services. An investment-demand function indicates the values of output demanded at various possible rates of interest. The latter will be denoted by r. Net exports of goods and services are included to make the model correct, but their analysis will be deferred to a later chapter.

Gross private domestic investment includes expenditures for new construction, both residential and nonresidential, producers' durable equipment, and desired net changes in business inventories. Note that because we are interested in determining an equilibrium level of Y, we include in investment demand only "wanted" or desired changes in business inventories. An "unwanted" actual increase of inventory would be followed by a decrease of Y as business tried to get rid of its excess inventory. On the other hand, an "unwanted" decrease of inventory would be followed by an increase of Y as business stepped up its output to restore inventories to the desired level.

Most of the components of investment demand (I) are demands by business for output with which to maintain or increase stocks of capital goods. These demanders are presumably motivated by a desire for profits, perhaps a desire to maximize their profits. For this purpose they compare the expected returns from new investment with the costs involved. However, some of investment demand, notably expenditures by homeowners for new residential construction, may not be profit-motivated. But even these demanders presumably arrive at decisions by balancing expected benefits and costs. And, other conditions being constant, they will presumably buy less when the cost to them is higher. Interest costs are an important part of the carrying charges of a house.

An investment-demand function, such as that illustrated in Fig. 15–3, is a typical demand curve showing the relation of quantity demanded to price. In this case, the price of loan funds, or the interest rate on investable funds, is measured along the horizontal axis. The values of output demanded for investment are measured along the vertical axis. The II curve depicts the size of investment demand at the various possible levels of r. From the point of view of the spender for investment, r is a cost. If he gets the money to finance investment by borrowing from others, r is the annual interest rate he must pay to lenders. If he finances

his investment spending by using his own money, r is his opportunity cost; it is the interest rate he sacrifices by using the money himself rather than by lending it to someone else. It is therefore plausible to assume that, other things remaining the same, a rise of interest rates will decrease the actual investment demand for output and a fall of interest rates will stimulate it.

We are engaging in oversimplification in assuming a single interest rate in the market. There are, of course, many rates. Moreover, other terms of lending and borrowing may change: the length of time for which lenders will make funds available, the risks that they will take at any given interest rate, the amount of security demanded for loans, and so on. Nevertheless, it will be convenient to let r represent the height of the structure of interest rates and the annual cost per dollar of borrowed funds. In drawing any demand curve, we have to assume that all other conditions affecting demand are given and unchanged. But it is important to know what determines the position of the demand curve. We need to answer questions such as these: Why is the demand curve neither higher nor lower at each level of interest rates? What forces can shift I upward at each rate of interest? What forces can shift the curve downward? To answer such questions, we need to know the motivations of those who spend for investment and the nature of the benefits they balance against interest costs in arriving at decisions as to whether to spend for investment and at what rate of expenditure.

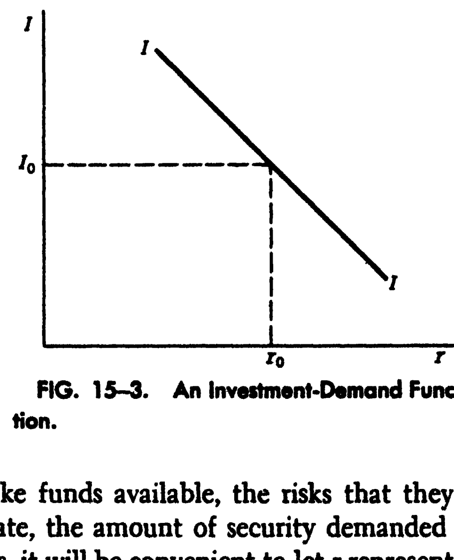

FIG. 15–3. An Investment-Demand Function.

Marginal Efficiency of Investment

The great bulk of investment expenditures are made by business firms intent on making net profits. Hence, in determining whether or not to make a capital expenditure, they ask, "Will the acquisition of this capital good add at least as much to my revenues as it adds to my costs?" This applies to purchases for replacement as well as to net additions to capital. Decisions as to the amount of new investment therefore depend on a comparison of interest costs and the expected annual rate of return on new investment. The latter has been given many names, including "marginal revenue product of capital" and "marginal efficiency of investment." We shall use the latter term and define it as the annual amount (stated as a percentage of the cost of the capital goods) that the acquisition of the new capital goods is expected to add to the enterprise's net revenues after deduction of all additional costs of operation except interest costs on the money used. For our purposes, we shall view the marginal efficiency of investment as a schedule or function showing the various amounts of new investment that are expected to yield at least various rates of return. The demand for investment is derived from the marginal efficiency of investment schedule. Enterprisers intent on maximizing their profits tend to buy those types and amounts of capital that they expect to yield a rate of return in excess of the interest cost of the money used to purchase them. Presumably, they will not buy capital whose expected rate of return is below the interest rate.

Note that we have emphasized the central role of "expected" annual rates of return on new investment. Enterprisers must base their decisions on their expectations as to future yields—on the best forecasts they can make. They cannot be certain as to these returns, for many types of capital yield their returns only over a long period and much can change in the meantime. But they must make decisions, even if they recognize the fallibility of their forecasts.

The schedule of the marginal efficiency of investment depends on many things, of which the following are among the more important.

1. Size and Composition of Stock. If the existing stock of capital goods is largely obsolete and too small to produce most economically the rate of output currently demanded, large amounts of new investment may be expected to yield high rates of return. But if the existing stock of capital goods is very large relative to the current demand for output and if it includes the most efficient types of capital that man knows how to make and utilize, only small amounts of new investment will be

profitable. If there is already excess capacity, business firms may refrain from replacing some of their equipment when it wears out.

2. Rate of Innovation. If the rate of innovation is high, it may be profitable to undertake much new investment in order to produce the new types of products or to use new and more economical processes of production. If the rate of innovation is low, the profitability of new investment goods for this purpose may be smaller.

3. Expected Future Behavior of Demands for Output. If demands for output are expected to rise rapidly, much new investment may be expected to yield high profits. If demands for output are expected to remain at existing levels and the present stock of capital goods is adequate, the demand for new capital goods may be largely a replacement demand. And if demands for output are expected to decline, many potential spenders for investment may not replace their capital equipment when it wears out.

4. Cost Expectations. Expectations as to future wages, other costs, taxes, and government policies also determine investment efficiency. Estimates of the profitability of new investment may be greatly affected by expectations regarding the future course of these factors.

5. State of "Business Psychology." In view of the scarcity and vagueness of our knowledge about the future and the precariousness of any forecast based on that knowledge, it is not at all surprising that expectations concerning the future should be greatly affected by prevailing conditions and the trends of the immediate past. As the late J. M. Keynes put it,

> It would be foolish, in forming our expectations, to attach great weight to matters which are very uncertain. It is reasonable, therefore, to be guided to a considerable degree by the facts about which we feel somewhat confident, even though they may be less decisively relevant to the issue than other facts about which our knowledge is vague and scanty. For this reason the facts of the existing situation enter, in a sense disproportionately, into the formation of our long-term expectation; our usual practice being to take the existing situation and to project it into the future, modified only to the extent that we have more or less definite reasons for expecting a change.[3]

This convention of projecting into the future the present situation, and particularly the trend of the immediate past, is an aggravating factor in the business cycle. In the period of upswing, an original increase in the profitability of production is likely to give birth to expectations of still

[3] J. M. Keynes, *The General Theory of Employment, Interest, and Money*, New York, Harcourt, Brace & World, 1936, p. 148.

greater profits, whereas in the downswing, an original decline is likely to breed expectations of continued contraction.

Partly because of the paucity and uncertainty of our knowledge concerning future events, expectations are inordinately influenced by waves of excessive optimism and pessimism. Realizing the untrustworthiness of his own opinions with respect to the future, each person relies heavily upon opinions of others, which may be as undependable as his own. By a process that only a social psychologist can explain, the public temperament fluctuates from exultation to melancholia. At one time, its exhibits the exuberance and optimism of a "new era." Then it lapses into dark discouragement and despair. In these alternating periods of overoptimism and overpessimism, enterprisers are prone to overestimate and underestimate the returns to be realized from new investment.

> It is an essential characteristic of the boom that investments which will in fact yield, say, 2 percent in conditions of full employment are made in the expectation of a yield of, say, 6 percent, and are valued accordingly. When disillusion comes, this expectation is replaced by a contrary "error of pessimism," with the result that the investments, which would in fact yield 2 percent in conditions of full employment, are expected to yield less than nothing; and the resulting collapse of new investment then leads to a state of unemployment in which the investments, which would have yielded 2 percent in conditions of full employment, in fact yield less than nothing.[4]

It is difficult to assess the relative importance of the state of "business psychology" as a determinant of the marginal efficiency of investment. It can easily be overstressed as a determinant of expectations. We should be quite suspicious of explanations based solely on mob psychology and ignoring such basic factors as the supply of capital goods relative to other factors of production, the state of technology and its rate of advance, the rate of growth of population, and so on. On the other hand, explanations based solely on these basic factors and their rates of change cannot deal adequately with short-run and cyclical shifts of the marginal efficiency of investment.

In any case, the schedule of the marginal efficiency of investment is capable of wide shifts. This should be borne in mind for two reasons:

1. When we draw an investment-demand schedule to show the effects of interest rates on investment demand, we are assuming that the schedule of the marginal efficiency of investment is given and constant.

2. We shall later want to deal with upward and downward shifts of

[4] *Ibid.*, p. 322.

the investment-demand schedule and their effects on Y. An upward shift of the II curve, an increase of investment demand at each interest rate, may be brought about by any force that raises the marginal efficiency of investment schedule. The II curve may be shifted downward at each level of interest rates by anything that lowers the marginal efficiency of investment schedule.

MARGINAL RESPONSIVENESS OF INVESTMENT DEMAND TO INTEREST RATES

Let us now return to the investment-demand curve that is drawn on the assumption that the marginal efficiency of investment is given and constant, and which therefore enables us to consider the effects of interest rates on the size of the investment demand for output. In determining the equilibrium level of Y, it is sometimes sufficient to know that I tends to be larger when r is lower, and lower when r is higher. For some purposes, however, it is useful to try to quantify this relationship, to ask how much a given change of interest rates would alter the size of the investment demand. We shall call this the *marginal responsiveness of investment to interest rates*. By this we shall mean the dollar change in the annual rate of investment expenditure for output in response to a change of 1 percentage point in the interest rate. This can be denoted by $\Delta I/\Delta r$, where ΔI is the change in the investment demand for output and Δr is a change of 1 percentage point in the interest rate. In Fig. 15–4, $\Delta I/\Delta r$ is clearly larger on the I_0I_0 investment-demand curve than it is on the I_1I_1 curve.[5]

EQUALITY OF I AND S

As has been seen, the saving-supply function depicts the values of output, at the various levels of output, that are not purchased for C and G purposes. It shows the values "left over" after C and G demands. The investment-demand function, on the other hand, depicts the values of output demanded for investment purposes at various levels of interest rates. Let us now see how these functions enter into the determination of the equilibrium level of Y.

In Fig. 15–5, the values of S and I at annual rates are shown on the vertical axis and the value of Y at annual rates on the horizontal axis. We

[5] An investment-demand curve need not, of course, be a straight line, and the value of $\frac{\Delta r}{\Delta I}$ may be different at different ranges of interest rates.

use here a very simple investment-demand function (II), assuming that it is a given absolute size and not responsive to interest rates.

The one major point to be made here is that income and output can be at an equilibrium level only if investment demand is exactly equal to the supply of saving. Given the II and SS functions, the only equilibrium level of Y is Y_0. Only at this level of Y is the investment demand for output exactly equal to the supply of output represented by the supply of saving, that is, to the supply of output in excess of the amount taken off

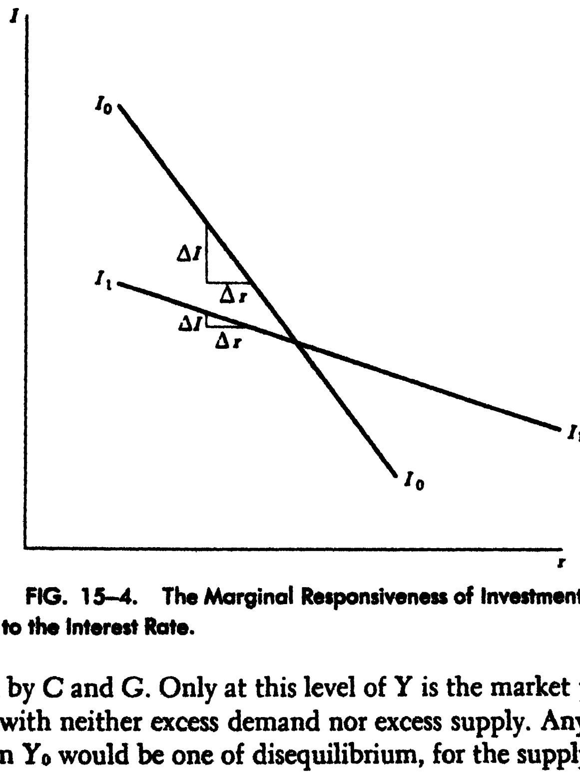

FIG. 15–4. The Marginal Responsiveness of Investment to the Interest Rate.

the market by C and G. Only at this level of Y is the market just cleared of output, with neither excess demand nor excess supply. Any level of Y greater than Y_0 would be one of disequilibrium, for the supply of output represented by saving would exceed investment demand; some part of the supply would not be cleared from the market. If such a situation occurred, producers might immediately respond by reducing their rate of output, thus lowering Y. If they did not respond quickly enough, some of their output would pile up in "unwanted" inventories, which would lead them to cut production to get rid of their excess stocks. In this process, they might temporarily reduce their output below Y_0 until their excess inventories had been sold off.

Any level of output below Y_0 would be one of disequilibrium, for at lower levels of Y, the investment demand for output would exceed the supply of output represented by saving. Faced by such a situation of excess demand, producers might immediately increase their rate of output, thereby raising the level of Y. If they did not step up output fast enough, they would experience an "unwanted" depletion of their inventories, which would lead them to step up production to rebuild their stocks. In this process, they might temporarily raise their rate of output above Y_0 until their inventories had been replenished.

Thus, equality of investment demand and saving supply is always a necessary condition for an equilibrium level of Y. If investment demand were completely unresponsive to r, an investment-demand function and a saving-supply function could together establish a unique equilibrium

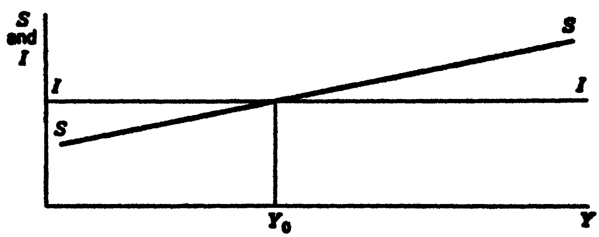

FIG. 15–5. The Equality of Investment Demand and the Supply of Saving.

level of Y with no help from the money-supply function and the demand for money-balances function. But this becomes impossible if investment demand is responsive to interest rates. In this case, there are many combinations of interest rates and income levels that will equalize *I* and *S*.

AN $I = S$ LINE

The $I = S$ line is illustrated in Fig. 15–6. The vertical scales in Parts A and B are the same, so that the same vertical heights indicate equal amounts of S and *I*. Even a casual inspection of the two upper graphs reveals that there are various combinations of interest rates and income levels that will produce the condition $I = S$. For example, $S = I$ at the low vertical level I_0S_0 if r is at the high level r_0, thereby holding I to a low level, and if Y is at the low level Y_0, thereby generating only a low supply of S. $I = S$ at the somewhat higher level I_1S_1 if the rate of inter-

est is at the lower level r_1, thereby stimulating I, and if Y is at the higher level Y_1, thereby generating a larger supply of saving. $I = S$ at the very high level I_2S_2 if the rate of interest is at the very low level r_2 and income is at the high level Y_2. We might thus note all the possible combinations of interest-rate levels and income levels that would produce the condition $I = S$.

This is done in Part C of Fig. 15–6. The line $I = S$ plots out all those combinations of r, measured on the vertical axis, and Y, measured on the

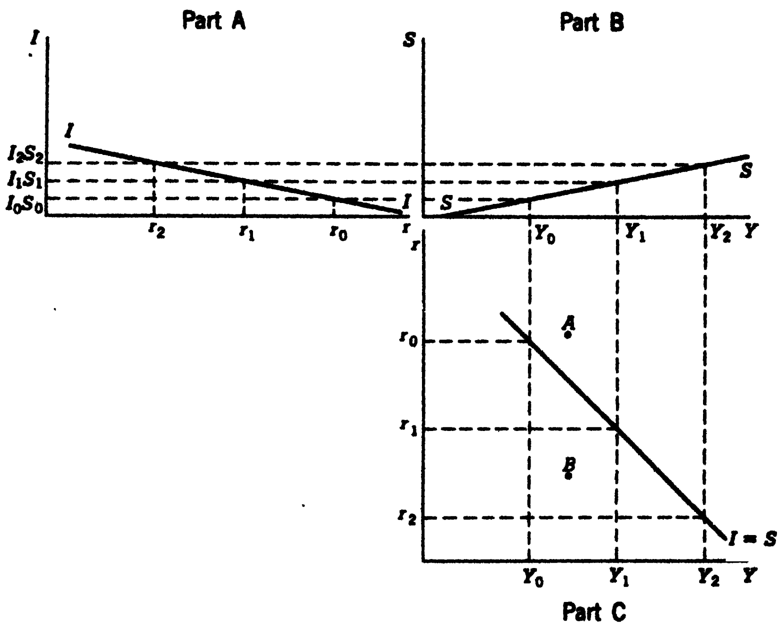

FIG. 15–6. Investment Demand and the Supply of Saving.

horizontal axis, at which S and I would be equal. The $I = S$ line slopes downward to the right because the supply of S would be larger at higher levels of income, and with a given investment demand function, I can be made correspondingly larger only by a fall of r.

No point representing a combination of r and Y that is off the $I = S$ line can represent equilibrium conditions. For example, consider any point A that lies above the $I = S$ line. At any such point, I would be less than S. We know this because at the same level of Y, there is some lower rate of interest directly below A on the $I = S$ line at which I is exactly equal to S. If, by some chance, the combination of r and Y represented

by point A should occur, the excess of S over I could be remedied only by a fall of interest rates to stimulate I, a decline of Y to reduce S, or some combination of changes of r and Y to a point on the $I = S$ line. On the other hand, at any point such as B, below the $I = S$ line, I would be greater than S. We know this because at the same level of Y, there is some higher rate of interest directly above B on the $I = S$ line at which I is exactly equal to S. A disequilibrium combination such as B could be remedied only by a rise of r to reduce I, an increase of Y to increase S, or a combination of changes of r and Y to a point on the $I = S$ line.

We are now at a point comparable to that reached toward the end of Chapter 14. There we concluded that the supply of money and demand-for-money functions are important determinants of equilibrium levels of Y and r, that Y and r can be in equilibrium only if the demand for money balances is exactly equal to the supply of money, but that these two functions cannot determine unique equilibrium levels of Y and r if L is responsive to interest rates. Now we conclude that saving-supply and investment-demand functions are important determinants of equilibrium levels of Y and r, that Y and r can be in equilibrium only if investment demand is exactly equal to saving supply, but that these two functions cannot determine unique equilibrium levels of Y and r if investment demand is responsive to interest rates. There is clearly need to bring these two branches of theory together. This will be done in the next chapter. Before doing this, however, it is essential to investigate "the multiplier," an important element in the theory of income determination.

THE MULTIPLIER

The *multiplier* refers to the fact that an autonomous increase or decrease in one type of expenditure for output can increase or decrease by some multiple the total expenditures for output by inducing consumption expenditures to change in the same direction. The total effect on the level of expenditures for output (ΔY) is equal to the autonomous change plus the induced change of consumption (ΔC). We shall find that the size of the multiplier is equal to

$$\frac{1}{\Delta S/\Delta Y}, \quad \text{or} \quad \frac{1}{1 - \Delta C/\Delta Y}$$

The autonomous rise or fall of expenditures can be in the form of I, G, or C. To illustrate the principles involved, let us assume that the autonomous change is an increase of investment demand, that $\Delta I = \$100$, and

that investment remains at this higher level. This increase of investment will directly increase Y by \$100 and also raise the community's income by the same amount. The community can be expected to use some part of this increase of income to increase its consumption expenditures. Let us suppose that conditions are such that the nation uses 60 percent of each increase of its income to raise C and the remaining 40 percent to raise S in the form of S_g, S_b, and S_p. That is, $\Delta C/\Delta Y = 0.6$ and $\Delta S/\Delta Y = 0.4$. Those whose incomes were increased by the rise of I will increase their C by \$60, the other \$40 being added to the rate of saving. This \$60 rise of consumption expenditures increases incomes in the consumer goods industries, and recipients will increase their consumption by 60 percent of the rise (or \$36), the other \$24 being used to increase S. Out of this \$36 rise of Y, \$21.60 will be used for further increases in C and \$14.40 to raise G, and so on. If we traced out the whole process, we should find that the equilibrium level of Y had been increased by \$250, of which \$100 resulted from the autonomous rise of I and \$150 from the induced rise of C. The multiplier, ΔY, divided by ΔI, is 2.5. It is equal to

$$\frac{1}{\Delta S/\Delta Y} = \frac{1}{0.4} = 2.5$$

It should be clear that the greater the $\Delta C/\Delta Y$ (that is, the lower $\Delta S/\Delta Y$), the larger will be the size of the multiplier. It should also be clear that the multiplier operates in the downward direction in response to an autonomous decline of expenditures for output. For example, trace out the effects on Y if G falls by \$200 and remains at the lower level and $\Delta C/\Delta Y = 0.5$.

The multiplier process can also be explained in terms of saving-investment relationships. For example, suppose that, starting from an equilibrium level of Y at which $I = S$, I rises by \$100 and remains at this higher level: $\Delta I = \$100$. The old level of income is no longer one of equilibrium, for at that level of Y there will now be a \$100 excess of I over S. If I remains at its new higher level, a new equilibrium will be reached only when S is also increased by \$100. But with a constant saving-supply function, S can be increased only by a rise of Y. How much Y will have to increase to raise S by \$100 varies reciprocally with the marginal responsiveness of S to Y. Suppose $\Delta S/\Delta Y = 0.4$. In this case, Y must rise by \$250 to raise S by \$100.

Let us consider this in steps:

1. Since I has risen \$100 and remains at the new level, S must rise by the same amount if a new equilibrium is to be established.

2. With a constant saving-supply function, only a rise of Y can increase S, and each dollar rise of Y will increase S by an amount equal to $\Delta S/\Delta Y$.
3. Since the required rise of $S = \$100$, we can write $\$100 = \Delta Y(\Delta S/\Delta Y)$. Dividing both sides of the equation by $\Delta S/\Delta Y$ to find the required increase of Y, we get

$$\Delta Y = \frac{\$100}{\Delta S/\Delta Y} \quad \text{or} \quad \$100 \frac{1}{\Delta S/\Delta Y}$$

If $\Delta S/\Delta Y = 0.4$,

$$Y = \$100 \frac{1}{0.4} = \$250$$

Only if Y rises by this amount will it be in equilibrium, with $I = S$. Any smaller rise of Y would leave S smaller than I, and the excess demand for output would tend to raise Y. But any larger rise of Y would make S larger than I, and the excess of total output over the total demand for it would depress Y.

As already noted, the size of the multiplier varies reciprocally with $\Delta S/\Delta Y$. Thus, if $\Delta S/\Delta Y = 0.1$, the multiplier is $1/0.1 = 10$. If $\Delta S/\Delta Y = 0.5$, the multiplier is $1/0.5 = 2$.

We shall use multiplier analysis for two major purposes. The first is to analyze the shape of the $I = S$ line with given and constant saving-supply and investment-demand functions. As shown in Part C of Fig. 15–6, the general charcteristic of an $I = S$ line is that it slopes downward to the right. This reflects the fact that I would be higher at lower interest rates and that S could also be higher only at a higher level of Y. For some analytical purposes this is sufficient information. For other purposes, we need to ask how much Y must increase in response to a given fall of r in order to maintain equality of I and S. In other words, what is the value of $\Delta Y/\Delta r$ on the $I = S$ line? This depends on the marginal responsiveness of investment to interest rates $\Delta I/\Delta r$ and on $1/(\Delta S/\Delta Y)$.

For example, suppose that interest rates are lower by some amount Δr. This will raise I by an amount that can be expressed as

$$\Delta I = \Delta r \frac{\Delta I}{\Delta r}$$

We know that a new equilibrium can be reached only when S has risen by an equal amount and that with a constant saving-supply function, S can be increased only by a rise of Y. We know also that Y will have risen sufficiently to make $\Delta S = \Delta I$ only when $\Delta Y\ (\Delta S/\Delta Y) = \Delta I$. This can also be expressed as $\Delta Y\ (\Delta S/\Delta Y) = \Delta r\ (\Delta I/\Delta r)$. Dividing both sides of the equation by Δr and $\Delta S/\Delta Y$, we get

$$\frac{\Delta Y}{\Delta r} = \frac{\Delta I}{\Delta r} \cdot \frac{1}{\Delta S/\Delta Y}$$

That is, $\Delta Y/\Delta r$ depends on: (1) the marginal responsiveness of investment to interest rates, and (2) the size of the multiplier, $1/(\Delta S/\Delta Y)$. The first determines the amount by which a given change of interest rates will change I. The second determines how much Y must change in order to change S by an amount equal to the change of I.

This finding has important policy implications. For example, suppose that M is increased in order to raise Y. The size of the resulting increase of Y will depend on the extent to which interest rates are lowered (Δr), the marginal responsiveness of investment to interest rates ($\Delta I/\Delta r$), and the size of the multiplier $1/(\Delta S/\Delta Y)$.

Multiplier analysis will also be used to explain rightward or leftward shifts of the $I = S$ line in response to shifts of investment-demand and saving-supply functions. For example, a given increase of the investment-demand function or decrease of the saving-supply function at each level of r will shift the $I = S$ curve to the right by an amount determined by $1/(\Delta S/\Delta Y)$. Similarly, a given decrease of investment demand or increase of saving supply at each level of r will shift the $I = S$ curve to the left by an amount determined by $1/(\Delta S/\Delta Y)$.

Multiplier analysis is an essential element in the theory of income determination. The forces and tendencies with which it deals are potent. However, it would be a mistake to assume that a given autonomous change of expenditures will in fact change Y by exactly the amount indicated by the multiplier. Multiplier analysis assumes that the process of increase or decrease of expenditures does not generate or encounter any change in interest rates or in the availability of funds that would "snub" the expansion or contraction. But something of this sort is likely to occur. For example, a rise of Y raises L_1 demands for money balances, makes only a smaller part of M available to satisfy L_2 demands, raises interest rates, and tends to discourage investment. This tends, of course, to "snub" the multiplier effect. This point will be elaborated later. However, enough has been said to indicate the danger of using any form of income theory that does not take into account the M and L functions.

16. Equilibrium

This chapter will bring together the analysis and findings of the two preceding chapters and show how equilibrium levels of money income and interest rates are determined and altered by four functions: (1) the money-supply function, (2) the demand-for-money-balances function, (3) the saving-supply function, and (4) the investment-demand function. An essential point is that Y and r can be in equilibrium only when two conditions are met simultaneously: when the demand for money balances is exactly equal to the money supply, and when investment demand is exactly equal to the supply of saving.

We shall first use simple statics to show how constant functions determine equilibrium levels of Y and r, and then we shall use comparative statics to show how shifts of one or more of the functions change equilibrium levels. Until further notice, the price level will be assumed to be constant so that changes in Y represent changes in real output or income.

STATIC EQUILIBRIUM

In Fig 16–1, a constant investment-demand function is depicted by II and a constant saving-supply function by SS. The $I = S$ line includes all those combinations of Y and r that would exactly equate I and S. We know, therefore, that equilibrium must lie somewhere on this line. The money-supply function is indicated by MM. The demand-for-money function is assumed to be a positive function of Y, such that $L_1 = jY$, and a negative function of r. The curve LY_e represents the demand function for money only when Y is at the equilibrium level Y_e. As noted in Chapter 14, it is possible to draw a whole family of L curves, one for each possible level of Y. The $L = M$ line includes all those combinations of Y and r that would exactly equate L and M, so we know that equilibrium must lie somewhere on this line.

As long as the four functions are constant, equilibrium can be achieved only with the combination of income at the level Y_e; interest rates, at the level r_e. Only at this combination is L exactly equated to M and I to S. Only at this combination are there no forces tending to change the level of Y or of r, or both.

This can be proved by showing that any other Y,r combination is not only one of disequilibrium, but also would generate forces serving to force Y and r toward equilibrium. As a first step toward this proof, let us recall some of our earlier findings. One necessary condition for equilibrium is that the quantity of money balances demanded be exactly equal to the

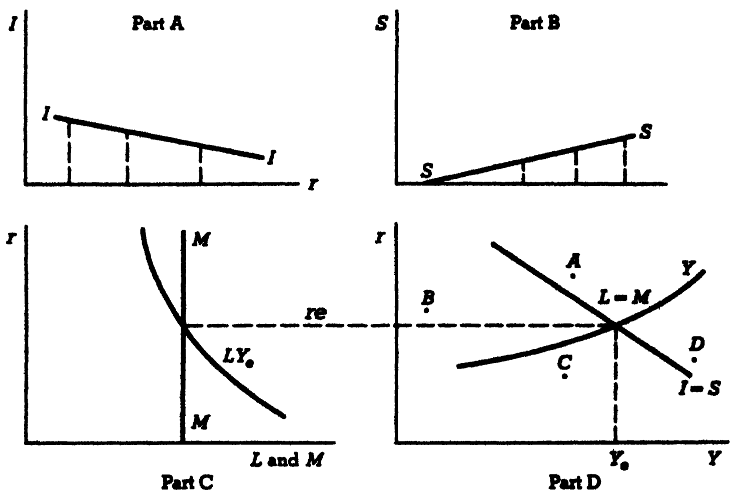

FIG. 16–1. Equilibrium with Constant Functions.

money supply. The $L = M$ line includes all the combinations of interest-rate levels and income levels that would achieve this equality with given money-supply and demand-for-money functions. At any combination of interest-rate and income levels not on the $L = M$ line, this equality would not be achieved. In Fig. 16–2 consider, for example, any point, such as A or B, lying above the $L = M$ line. At any such point, the supply of money would exceed the demand for money balances. We know this because L is exactly equal to M at some point vertically below on the $L = M$ line at the same level of income, and therefore with the same L_1 demand for money but at a lower interest rate. Therefore, M must exceed L at a higher level of interest rates. The community will try to rid itself of its excess money balances by increasing its demand for

securities or for output, or for both. Suppose it uses its excess balances to increase its lendings. This will tend to force interest rates down, as indicated by the downward-pointing arrows. If it uses its excess money balances to increase its demands for output, it will tend to raise the level of income, as indicated by the rightward-pointing arrows. In the remainder of this chapter, we shall make repeated use of this proposition: *An excess of the supply of money over demanded balances tends to lower interest rates or to increase demands for output, or both.*

Consider now any combinations of income and interest-rate levels, such as those represented by points C and D, lying below the $L = M$ line. At any such point, the quantity of money balances demanded would exceed the money supply. We know this because L is exactly

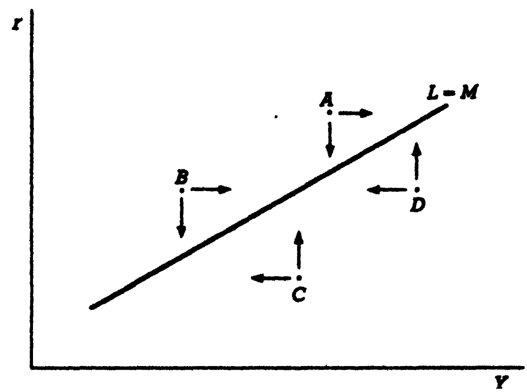

FIG. 16–2. Equality and Inequality of L and M.

equal to M at some point vertically above on the $L = M$ line at the same level of income, and therefore with the same L_1 demand for money but at a higher interest rate. Therefore, L must exceed M at the lower interest rate. Members of the community will try to repair the deficiencies in their money balances by decreasing their demands for securities or for output, or both. To the degree that they decrease their demand for securities, they tend to raise interest rates, as indicated by the upward-pointing arrows. To the degree that they decrease their demands for output, they tend to lower the level of income, as indicated by the left-ward-pointing arrows. We shall make frequent use of this proposition: *An excess of the demand for money balances over the money supply tends to raise interest rates or to decrease demands for output, or both.*

Another necessary condition for equilibrium is that investment demand be exactly equal to saving supply. The $I = S$ line includes all the

combinations of interest-rate and income levels that would achieve this equality with given investment-demand and saving-supply functions. At any combination of interest-rate and income levels not on the $I = S$ line, this equality would not be achieved. In Fig. 16–3 consider, for example, any point, such as B or C, lying below the $I = S$ line. At any such point, investment demand would exceed the supply of saving. We know this because I is exactly equal to S at some point vertically above on the $I = S$ line at the same level of income, and therefore with the same supply of S but at a higher interest rate. Investment demand must therefore exceed the supply of saving at the lower interest rate. Remember

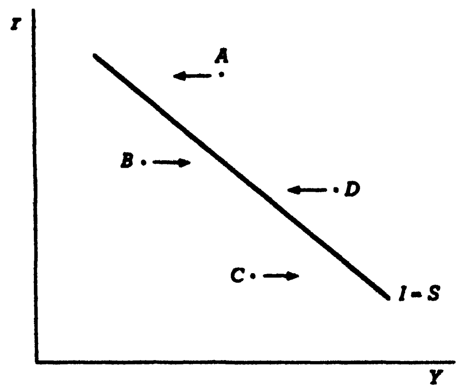

FIG. 16–3. Equality and Inequality of I and S.

this proposition: *An excess of investment demand over the supply of saving tends to raise the level of income.* This is indicated by the rightward-pointing arrows.

Now consider any combination of interest-rate and income levels, such as those represented by points A and D, lying above the $I = S$ line. At any such point, the supply of saving would exceed investment demand. We know this because I is exactly equal to S at some point vertically below on the $I = S$ line at the same level of income, and therefore with the same supply of saving but at a lower interest rate. At a higher interest, I must be less than S. Another proposition to keep in mind: *An excess of saving supply over investment demand tends to lower the level of income.* This is indicated by the leftward-pointing arrows.

All this is brought together in Fig. 16–4. We find that, given the four functions, the equilibrium levels of interest rates and income are those

represented by Y_e, r_e. Only at this combination are the two necessary conditions met simultaneously: $L = M$ and $I = S$. No other Y, r combination can make this claim! For example, consider combination A, lying above both the $L = M$ and $I = S$ lines. The supply of money would exceed the demand for money, and the excess supply of money would tend to lower interest rates or to increase expenditures for output, or both. The excess of S over I tends to lower the level of income, but any such decline of Y would decrease the L_1 demand for money, raise even further the excess of M over L_1, and increase downward pressures on interest rates.

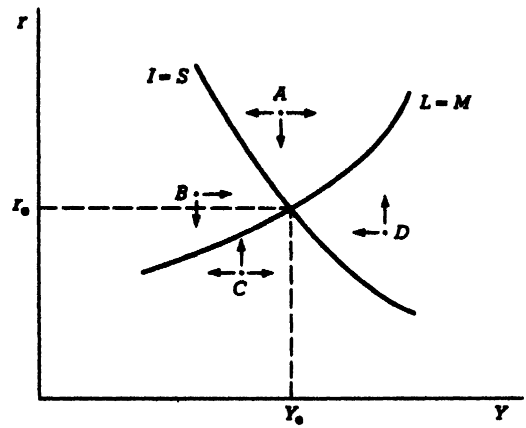

FIG. 16–4. Equality of $L = M$ and $I = S$.

Now consider combination B, lying below the $I = S$ line and above the $L = M$ line. The excess of I over S will tend to raise Y, and the excess of M over L will tend to lower interest rates or raise Y, or both. Any decrease of interest rates would increase the excess of I over S and increase expansionary forces. Combination C lies below both the $L = M$ and the $I = S$ curves. The excess of I over S tends to increase Y. The excess of L over M tends to lower Y, but any such decrease would decrease S and make even larger the excess of I over S. Finally, consider combination D, which lies above the $I = S$ line and below the $L = M$ line. The excess of S over I would tend to lower Y, and the excess of L over M would tend to raise r or to lower Y, or both. Thus, any departure from equilibrium creates forces that tend to restore equilibrium.

In short, we find that the equilibrium levels of income and interest

rates are determined simultaneously, that neither can be in equilibrium while the other is in disequilibrium, and that equilibrium conditions are determined by all four functions.

We shall now use comparative statics to analyze the effects of shifts of the four functions. In each case, we shall assume that we start from equilibrium conditions and that one of the functions is shifted while the other functions remain constant.

INCREASE OF M OR DECREASE OF L

This analysis is applicable to both an increase of the money-supply function while the demand function for money remains constant and to a decrease of the demand function for money while the money-supply function remains constant. By a decrease in the demand function for money, we mean a decrease in the quantity of balances demanded at each level of income and interest rates. Such a decrease in the demand for balances can create an excess of the supply of money over the demand for money, just as could an increase of M. This should be kept in mind as we analyze the effects of an increase in the money supply.

Let us start from an equilibrium situation in which $L = M$ and $I = S$ at income level Y_e and interest rate r_e, as shown in Fig. 16–5. Now suppose that while the other three functions remain constant, the money supply is increased by some amount, such as \$10 billion. The Y_e, r_e combination will no longer be one of equilibrium because at that combination the supply of money will exceed demanded balances by \$10 billion. The community will seek to get rid of the excess supply of money by increasing its expenditures for output, thereby raising Y, or by increasing its lending and purchases of securities, thereby tending to lower r, or both. Let us assume that the new money was injected through increased loans by banks or by bank purchases of securities. The initial impact may be largely on interest rates, but the fall of interest rates will stimulate investment spending and induce further increases in demands for output.

In any case, a new equilibrium can exist only when the quantity of balances demanded is equal to the expanded money supply. And with a constant demand for money function, the quantity of balances demanded can be increased only by a rise of Y, which would increase balances demanded for L_1 purposes, or by a decrease of r which would increase balances demanded for L_2 purposes, or some combination of the

two. This is illustrated in Fig. 16–5 by the $L = M_1$ line, which lies to the right of and below the initial $L = M$ line. The new equilibrium must lie somewhere on this line.

This brings up important questions. What is the maximum amount by which Y can expand without increasing demanded money balances by more than the increase of the money supply? In other words, *what is the rightward shift of the* L = M *line at each level of interest rates?* What is the maximum amount by which r can decrease without causing demanded balances to rise by more than the increase of M? In other words, *what is the downward shift of the* L = M *line?* The bounds of

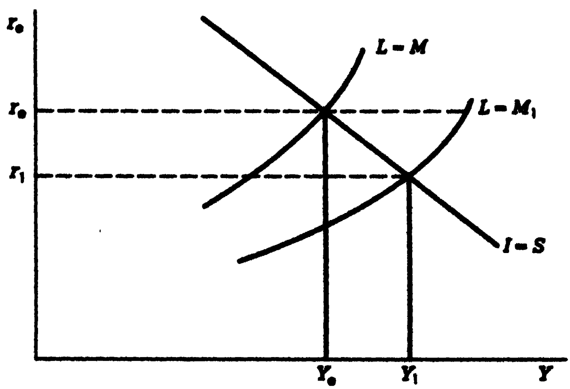

FIG. 16–5. Effects of an Increase in the Money Supply.

the possible rise of Y and of the possible decrease of r in response to a given change of M depend on the answers to these questions.

The size of the rightward shift at each level of interest rates depends on the marginal responsiveness of the demand for money to income, which we designate as $\Delta L/\Delta Y$. If each dollar rise of Y leads the community to demand ⅕ of a dollar more in balances for transactions purposes, each dollar increase in the money supply will support a \$5.00 rise of Y, and a \$10 billion rise of the money supply would support a \$50 billion rise of Y. However, if $\Delta L/\Delta Y = 1/10$, the \$10 billion increase of M would, if all were available for transactions purposes, support a \$100 billion rise of Y.

This can be shown as follows: Let $\Delta M =$ \$10 billion. We know that equilibrium can be restored only when L has risen by the same amount. But at each interest rate, the L_2 demand will be the same as before, so that the entire increase must occur in the balances demanded for L_1 purposes. With a constant demand

for money function, this can be achieved only by a rise of Y. So, in the new equilibrium at each level of interest rates, the following condition must obtain:

$$\Delta L = \Delta M$$

but $\Delta L = \Delta Y\ (\Delta L/\Delta Y)$, and so

$$\Delta Y \frac{\Delta L}{\Delta Y} = \Delta M$$

Dividing both sides by $\Delta L/\Delta M$ we get

$$\Delta Y = \Delta M \frac{1}{\Delta L/\Delta Y}$$

Thus, if $\Delta M = \$10$ billion and $\Delta L/\Delta Y = 1.5$, $\$50 = \$10\ (1/\tfrac{1}{5})$.

The maximum extent to which interest rates can be reduced by a given increase in the money supply depends on the marginal responsiveness of the demand for money balances to interest rates, $\Delta L/\Delta r$. Suppose that the demand for money is completely unresponsive to interest rates; that $\Delta L/\Delta r = 0$. In this case, each decline of interest rates would bring no increase in the quantities of balances demanded for L_2 purposes, the fall of interest rates would not be inhibited by "inducing hoarding," and all ΔM would be available for transactions purposes. Now suppose that $\Delta L/\Delta r$ is very high; that each decline of r increases greatly the quantity of balances demanded for L_2 purposes. The fall of interest rates will be narrowly limited by this "induced hoarding," and such limited declines of interest rates as do occur will greatly increase balances demanded for L_2 purposes and leave only small amounts to support increases in Y.

The importance of the size of $\Delta L/\Delta r$ is indicated in Fig. 16–6. Both ΔM and $\Delta L/\Delta Y$ are assumed to be the same in Parts A and B. The $I = S$ lines are also the same, but in Part A we assume $\Delta L/\Delta r = 0$ at all interest rates above zero. Under such conditions, the $L = M$ line is completely vertical; changes in interest rates change neither the quantities of balances demanded for L_2 purposes nor the amounts available for transactions purposes. Declines of interest rates are not inhibited by "inducing hoarding." Also, the entire amount of ΔM is available to support increases in Y, as indicated by the shift from $L = M$ to $L = M_1$. Note that in this case, the increase of the money supply induces a large decrease of interest rates and a large rise of income.

In Part B, we assume that $\Delta L/\Delta r$ is very large. Because each decline of interest rates increases greatly the quantity of balances demanded for L_2 purposes, only a small decline of interest rates is possible. And such declines of r as do occur will reduce greatly the amount of the increased money supply that becomes available for transactions purposes. In this

case, both the decline of interest rates and the induced rise of income are much smaller.

In fact, the size of $\Delta L/\Delta r$ is probably different at different ranges of interest rates. At levels of interest that are very low by historical standards, $\Delta L/\Delta r$ may be very high, as exemplified by Keynes' "liquidity trap." In this range, the $L = M$ line may approach the horizontal. At higher rates of interest, $\Delta L/\Delta r$ may be small, so that the $L = M$ line approaches a vertical position.

These findings have important implications for monetary policy, for the effects of any given change in the money supply depend heavily on the sizes of $\Delta L/\Delta r$ and $\Delta L/\Delta Y$. If $\Delta L/\Delta r$ is very small, interest rates may

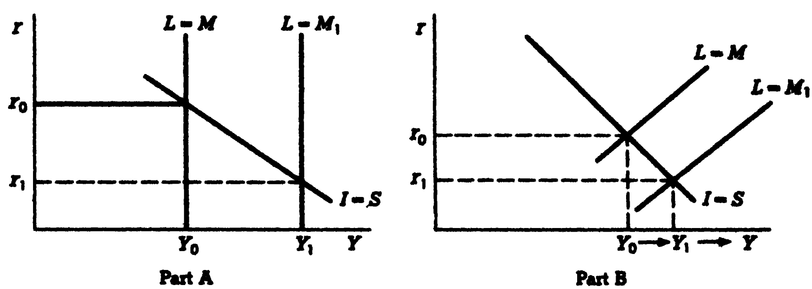

FIG. 16–6. $L = M$ Lines.

be lowered markedly, but if it is very high, interest rates may be lowered only slightly. And the smaller the $\Delta L/\Delta Y$, the greater is the increase of income that can be supported by any given increase in M.

Shape of the $I = S$ Line

The total effects of a given increase in the money supply depend not only on the foregoing characteristics of the demand-for-money function, but also on the shape of the $I = S$ line in the relevant range. This is illustrated in Fig. 16–7. Before the increase in the money supply, Y and r were in equilibrium at Y_0 and r_0. The increase in the money supply shifted the $L = M$ line to $L = M_1$. The new equilibrium must lie somewhere on this line, but where it will lie on that line depends on the shape of the $I = S$ line. If this is represented by the almost vertical $I = S$ line, Y will rise only from Y_0 to Y_1, and r will fall from r_0 to r_1. However, with the "flatter" line, $I^1 = S^1$, Y will rise from Y_0 to Y_2 and r will fall only from r_0 to r_2. In this case, the given increase of the money supply obviously brings about a much greater increase in Y.

As we found earlier, the "flatness" of an $I = S$ line (the size of $\Delta Y/\Delta r$

on that line) depends on the marginal responsiveness of investment to interest rates ($\Delta I/\Delta r$) and on the size of the multiplier $1/(\Delta S/\Delta Y)$ or $1/[1 - (\Delta c/\Delta Y)]$. That is,

$$\frac{\Delta Y}{\Delta r} = \frac{\Delta I}{\Delta r} \cdot \frac{1}{\Delta S/\Delta Y}$$

If investment expenditures are completely unresponsive to interest rates, there will be no increase of investment expenditures and no change of Y. But the more responsive is investment to interest rates, the greater will be the increase of investment expenditures and national income. How much each dollar increase of investment demand will increase Y depends on the size of the multiplier, which depends on $\Delta C/\Delta Y$.

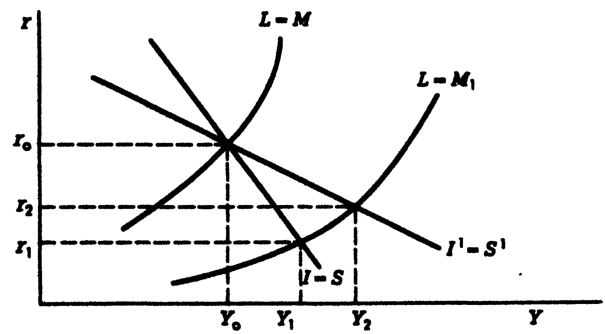

FIG. 16–7. $I = S$ Lines.

Summary

An increase of the money supply while the other three functions remain constant tends to lower interest rates and to raise the level of expenditures for output. How much a given increase in the money supply will lower interest rates and increase expenditures for output and how the effects will be distributed between the two depend on the characteristics of the other functions:

1. The marginal responsiveness of the demand for money to income, $\Delta L/\Delta Y$, determines the maximum extent to which income can rise without increasing demanded balances by more than the increase in the money supply. This is represented by the rightward shift of the $L = M$ line. However, the other functions may be such that this maximum rise of income is not achieved.

2. Consider the marginal responsiveness of the demand for money to

interest rates, $\Delta L/\Delta r$. If the demand for money is almost completely unresponsive to interest rates, the fall of interest rates will not be inhibited by "inducing hoarding," and a large fall of interest rates may be achieved to stimulate investment spending. But to the extent that the demand for money is responsive to interest rates, only a smaller decline of interest rates is achievable with any given increase in the money supply.

3. There is also the marginal responsiveness of investment demand to interest rates, $\Delta I/\Delta r$. If investment is completely unresponsive to interest rates, no rise of expenditures for output can be achieved by lowering interest rates. However, the more responsive is investment, the more will each fall of interest rates increase investment demand for output and its contribution to the community's disposable income.

4. With regard to the marginal responsiveness of consumption to income, $\Delta C/\Delta Y$, we find that the greater $\Delta C/\Delta Y$, the greater will be the multiplier effects of each dollar change of investment expenditures. The outcome depends not on one of these things alone but on all together.

DECREASE OF *M* OR INCREASE OF *L*

Because the analysis is symmetrical with that in the preceding section, we can deal briefly with the case of a decrease in the money-supply function or an increase in the demand-for-money-balances function (Fig. 16–8).

We start from an equilibrium situation in which Y and r are in equilibrium at Y_0 and r_0. Now assume that M is decreased by some amount, such as \$10 billion. This will create a disequilibrium, for at Y_0,r_0 the demand for money balances will exceed the reduced supply of \$10 billion. Those with deficient balances will attempt to rebuild them by decreasing their demands for other things. This process must continue until the quantity of balances demanded has been reduced by \$10 billion by a decrease in the level of income or an increase in interest rates, or some combination of the two. This is illustrated by the shift from $L = M_0$ to $L = M_1$. The new equilibrium must lie somewhere on this line. However, the size of the leftward and upward shift of the $L = M$ line depends on the marginal responsiveness of the demand for money to income and to interest rates.

The maximum amount by which Y would have to decrease to reduce the demand for money by \$10 billion depends on $\Delta L/\Delta Y$. The larger $\Delta L/\Delta Y$, the smaller is the decline of Y required to reduce the demand for money balances by \$10 billion. For example, if the community re-

duces its demand for transactions balances by one-fifth dollar with each \$1.00 decline of the level of national income, Y would have to fall only \$50 billion to reduce demanded balances by \$10 billion. But if $\Delta L/\Delta Y$ is only one-tenth, Y would have to fall \$100 billion to reduce L by \$10 billion. Smaller declines of Y will be required to the extent that the demand for money is responsive to interest rates. If $\Delta L/\Delta r$ is very large, each rise of interest rates will free large amounts of money from L_2 uses, make them available for transactions purposes, and inhibit increases of interest rates. In this case, the $L = M$ line approaches a horizontal position. However, if $\Delta L/\Delta r$ is very small, each rise of interest rates will free

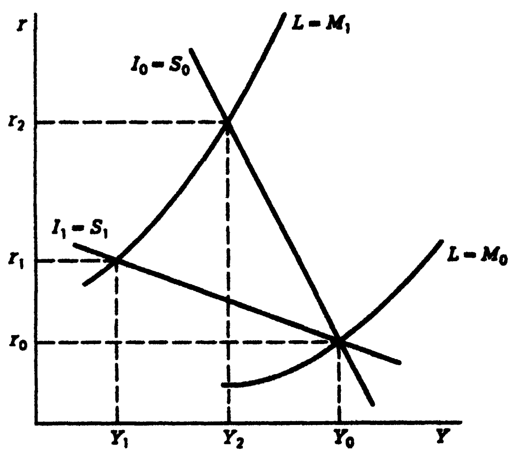

FIG. 16–8. Effects of a Decrease of the Money Supply.

only negligible amounts of balances for transactions purposes, so that increases of interest rates are likely to be larger and income must fall more to bring L into equality with the decreased money supply.

Figure 16–8 shows that the outcome also depends on the shape of the $I = S$ line, as determined by the marginal responsiveness of investment to interest rates and the marginal responsiveness of consumption to income. Both a high $\Delta I/\Delta r$ and a high $\Delta C/\Delta Y$ tend to make the $I = S$ line flat, so that the effects will be a larger decline of Y and only a smaller decline for r. This is illustrated by the $I_1 = S_1$ line. But to the extent that $\Delta I/\Delta r$ and $\Delta C/\Delta Y$ are smaller, the $I = S$ line will be steeper, the decline of Y smaller, and the rise of r larger. This is illustrated by $I_0 = S_0$ line.

Here, again, the outcome depends not on one of these things alone but

on all together. The size of the reduction of expenditures for output resulting from any given decrease in the money supply tends to vary inversely with $\Delta L/\Delta r$ and $\Delta L/\Delta Y$ and directly with $\Delta I/\Delta r$ and $\Delta C/\Delta Y$.

SHIFTS OF INVESTMENT-DEMAND FUNCTIONS

Let us now investigate the effects of increases and decreases of the investment-demand function while the other three functions remain constant.

Increase of Investment Demand

Investment demand can be increased at each level of interest rates by anything giving rise to expectations of higher rates of return on new investment. For example, it could result from new technological breakthroughs that increase opportunities for profitable investment, from more optimistic expectations concerning future demands for output, from the election of a popular new President who is expected to create a favorable environment for business, from a rise of optimism in general, and so on. Such a rise of investment demand is illustrated in Fig. 16–9 by the upward shift from I_0I_0 to I_1I_1. Let us assume that the increase of I at each level of r is \$5 billion.

Before this rise of investment demand, Y and r were in equilibrium at Y_e and r_e. But this combination is now one of disequilibrium, for investment demand will now exceed saving supply by \$5 billion, and the excess demand for output will tend to raise Y. Equilibrium can be restored only by an increase of interest rates to shrink I or a rise of the level of income to increase S, or some combination of the two. How much would Y have to rise at each level of r to increase S by \$5 billion, the assumed increase of I? Here, again, the answer is supplied by our old friend the multiplier, or $1/(\Delta S/\Delta Y)$. If $\Delta S/\Delta Y = 1/5$, the multiplier is 5 and Y would have to rise \$25 billion to increase S by \$5 billion. This is indicated by the $I_1 = S$ line, which lies to the right of the $I_0 = S$ line by \$25 billion. The new equilibrium must lie somewhere on this line.

Will Y actually increase \$25 billion if investment demand rises by \$5 billion and $\Delta S/\Delta Y$ is $1/5$? It will if the rise of Y does not bring any increase of interest rates, and this may happen if the money supply is increased sufficiently or if the money supply is constant but the demand for money is completely responsive to interest rates at the level r_e. The latter is depicted by the horizontal line $L = M_1$. In this case, ample amounts of money to finance higher levels of Y are disgorged from L_2 balances with no significant rise of interest rates, the rise of investment

expenditures is not inhibited by an increase of interest costs, and Y rises by the full amount indicated by the multiplier.

But what if the demand for money balances is completely unresponsive to interest rates at levels above r_0? This is illustrated by the vertical $L = M_2$ line. Further rises of interest rates above this level release no money from L_2 balances. In such a case, there can be no actual rise of investment expenditures and no increase of income. The only effect is to raise interest rates sufficiently to hold investment expenditures to the old level.

The $L = M$ line sloping upward to the right in Fig. 16–9 illustrates

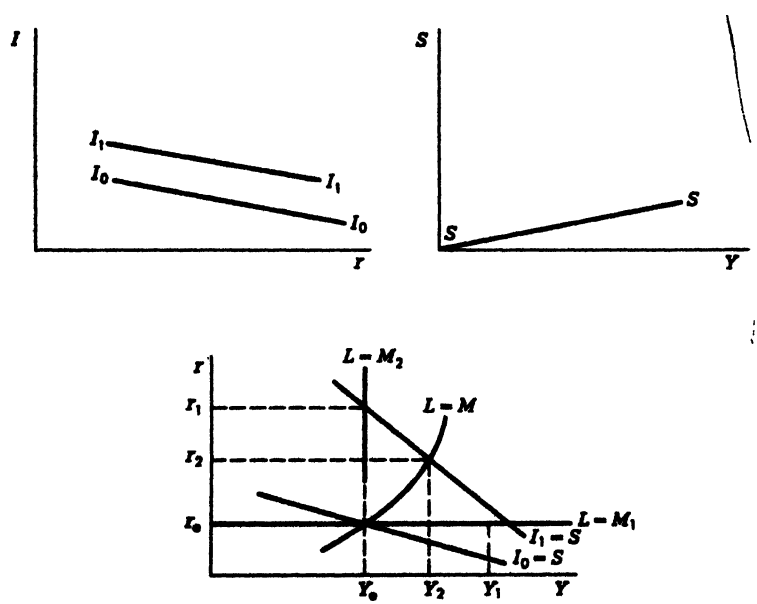

FIG. 16–9. Increase in Investment Demand.

intermediate cases in which the demand for money balances is somewhat, but not completely, responsive to interest rates. In such cases, the effects of an increase of investment demand will be to raise both the level of income and the level of interest rates, but the rise of income will not be so great as it would have been if interest rates had not risen to discourage investment.

This discussion has brought out several important points. In the first place, it reminds us that upward and downward shifts of the investment-demand function are large and frequent sources of disturbances to the economy. This applies both to demands for output for changing the size

of business inventories and to demands for new construction and producers' durable equipment. At one time, business may not demand any output to make net additions to inventories. A little later, it may demand large amounts for this purpose; and this may be followed by a sharp drop in such demands. There are also upsurges and downsurges in demands for new housing, for nonresidential construction, and for the wide range of things included under the general heading of producers' durable equipment. Such shifts of investment demand directly shift the demand for output, but they may through their multiplier effects induce larger changes in consumption expenditures.

In the second place, this case indicates the danger of talking about actual multiplier effects without considering conditions relating to the supply of money and the demand for money. The mere fact that the community would like to increase its rate of expenditures for output by \$5 billion at the prevailing rate of interest does not assure that interest rates will not rise and choke off the rise of investment spending.

In the third place, this case has important implications for monetary policy. Many, if not a majority, of the actions of the monetary authority are "defensive" in nature; they are designed to prevent such things as shifts of investment demand or of the supply of saving from having undesired effects on the economy. An increase of investment demand such as we assumed might well create strong inflationary pressures. Let us suppose that it does—that the old level of income, Y_e, was one of full employment and that any further increase in the demand for output would necessarily be reflected in increased prices. In dealing with a rise of investment demand under such conditions, the monetary authority should keep the following points in mind:

1. A purely defensive policy of preventing any rise in the supply of money will be inadequate if the demand for money is at all responsive to interest rates. As the rise of investment demand tends to raise interest rates, each rise of r will release money (inactive L_2 balances) to finance the rise of investment expenditures and to provide money to satisfy the larger L_1 demand as Y rises. Thus, to prevent any such rise from occurring, the monetary authority would have to reduce the money supply enough to absorb or offset the money released from L_2 balances.

2. With a given supply-of-saving function, the appropriate level of market rates of interest depends on the height of the investment-demand function. For example, when the investment-demand function was I_0I_0, the interest rate r_e may have been appropriate for maintaining expenditures for output at the full-employment-without-inflation level Y_e. But after investment demand had risen to I_1I_1, reflecting expectations of

much higher returns on new investment, the level of interest rates would have had to rise to r_1 to prevent expenditures for output from rising above Y_e. Any lower level of r would then be inflationary. Suppose, for example, that despite the rise of investment demand, the monetary authority tried to maintain interest rates at the old level r_e, doing so by keeping the banks well supplied with increased reserves and lending power. The community would spend more for investment, but with the economy already operating at capacity levels, the effect may be largely to bid up the prices of capital goods. Such price increases may not deter at all the purchasers of capital goods, for they may expect their dollar net returns to rise at least in proportion. These increased expenditures would enhance disposable incomes and increase consumption expenditures, and so on. As indicated earlier, an inflationary spiral could ensue, ending only when interest rates are increased sufficiently or when the marginal efficiency of capital declined.

Decrease of Investment Demand

A decrease of investment demand can be illustrated in Fig. 16–9 by a downward shift from I_1I_1 to I_0I_0. Such a decrease of investment demand at each level of interest rates can result from anything that decreases the expected profitability of new investment—from such things as a temporary shortage of profitable investment opportunities when new opportunities fail to develop as fast as old ones are used up, from a deterioration of expectations concerning future demands for output, and so on. Let us suppose that for such reasons, investment demand at each level of interest rates falls by $5 billion.

It is clear that each Y,r combination that formerly equalized I and S will no longer do so. With I reduced by $5 billion at each level, or r, S would have to fall by the same amount to become equal to I. But S could be reduced only by a decline of Y. The size of the reduction of Y required to reduce S by $5 billion depends, of course, on the size of the multiplier. For example, if $\Delta S/\Delta Y = 1/5$, the multiplier is 5 and Y would have to fall by $25 billion to reduce S by $5 billion. All the new possible combinations of Y and r at which the supply of saving would be equal to the new lower level of investment demand are on the line $I_0 = S$, which lies to the left of the old I_1S_1 line at each level of interest rates by the amount $\Delta Y = \Delta I\,[1/(\Delta S/\Delta Y)]$.

Will Y actually fall by an amount equal to the $5 billion decrease in investment demand times the multiplier? It will if interest rates do not fall at all, so that I actually declines $5 billion. Suppose, for example, that at the old level of r, the demand for money is completely responsive

to interest rates. That is, the $L = M$ curve is horizontal at that level of r. In this case, the community will not lend at any lower rate, the interest rate cannot fall, and the decline of the investment-demand function cannot be offset at all by cheapening of investable funds. But the downward shift of the investment-demand schedule may induce some decrease of interest rates, which by encouraging investment may offset at least in part the downward shift of the investment function. (Note what happens to the value of I on the I_0I_0 curve as r falls.) Let us take the extreme case in which the $L = M$ curve is completely vertical; that is, the demand for money is completely unresponsive to interest rates. In this case, interest rates may fall markedly, thereby helping to sustain the actual rate of investment spending.

Economists have pointed out, as noted earlier, that a decline of the money value of Y will itself tend to lower interest rates if the money supply remains constant. With declines in Y, the transactions demand for money will decline, thereby increasing the supply available for L_2 purposes. As its L_2 balances rise, the community will try to get rid of the excess by increasing the supply of investable funds, thereby lowering interest rates. Some economists have argued that this "automatic" effect may lower interest rates sufficiently so that expansionary policies by the monetary authority will be unnecessary. For several reasons most economists now doubt this.

1. It may operate too slowly. In the meantime the economy suffers from underemployment.
2. Because the demand for money may be highly responsive to interest rates, most of the money freed from L_1 balances by the decline of Y may not appear in the market as a supply of investable funds, but may be added to inactive L_2 balances.
3. Investment may be relatively unresponsive to such decreases of interest rates as do occur. For such reasons, most economists now believe that the "automatic" effects should be supplemented by an expansionary monetary policy.

The appropriate policy under such conditions is, of course, to increase the money supply in order to create an excess of the supply of money over the demand for money, so that the community will try to get rid of the excess supply by increasing its expenditures for output or by enhancing the supply of investable funds, or by some combination of the two. If the money supply is increased in ways that do not directly raise money incomes or increase the net wealth position of the community (for example, through open-market operations or decreases in member-bank reserve requirements), the initial impact is likely to be that of increasing the supply of investable funds and lowering interest rates. But

can we be assured that such an easy-money policy will succeed in preventing any decline of investment expenditures? We cannot. Let us consider two adverse cases:

1. The investment-demand function has declined so much that the old rate of investment expenditures can be maintained only if interest rates are at or below zero. But when the community can hold money balances at no out-of-pocket cost, it is obviously impossible to drive interest rates down to zero, to say nothing of negative levels.

2. Investment expenditures can be maintained at their old level at some interest rate above zero, but that rate is below the minimum rate at which the banks and the community will lend. At some higher rate, all new money will simply be added to L_2 balances; it will disappear into the liquidity trap. In such cases, an expansionary monetary policy cannot alone prevent a decline of investment expenditures or raise the level of income. For this purpose it will require the assistance of government fiscal policy.

It would, however, be too pessimistic to conclude that easy-money policies are useless in the face of a decline of the investment-demand function. Its advantages are fivefold:

1. As a minimum, such policies can lessen pressures by banks for repayment of outstanding loans and can encourage banks to meet requests for loans. Some recessions and depressions have been deepened and prolonged by the unwillingness of banks to satisfy the loan demands that they received. This was due in part to fears of loss, in part to inadequate bank liquidity. A policy of flooding the banks with excess reserves can make them more receptive to such loan demands as they do receive.

2. Such policies may succeed in lowering interest rates markedly. This is especially true when rates were formerly high by historical standards. Under such conditions, it may not be difficult to convince the community that rates will be even lower in the future.

3. If the decline of the investment-demand function is not severe, an easy-money policy alone may be sufficient to prevent a decline of investment spending. The investment-demand function may still be high and responsive enough to a decline of interest rates to enable investment expenditures to be maintained at their old level at an interest rate that is still high enough to prevent all the new money from being added to L_2 balances.

4. Even if it does not succeed in preventing a decline of investment spending, an easy-money policy may reduce the extent of the decline.

5. If deficit spending by the government is invoked to combat the decline, an easy-money policy can perform a useful function in assuring

that the government's borrowing does not decrease the supply or increase the cost of investable funds for private use. Some other effects of easy-money policies will be discussed later.

SHIFTS OF THE SAVING-SUPPLY FUNCTION

Let us now trace out the effects of shifts of the saving-supply function, assuming the other three functions to remain constant. By an increase of this function, we mean an increase in the supply of saving at each level of Y, and by a decrease, we mean a decrease of saving at each level of Y.

The level of saving at any level of income can be expressed as

$$S = Y - (C + G)$$

This way of expressing S makes it clear that a decrease of S at each level of Y reflects an equal increase of the demand for output at that level of Y in the form of $C + G$. On the other hand, a rise of S at each level of Y reflects an equal decrease in the demand for output at that level of Y in the form of $C + G$.

When we look at S in this way, it seems reasonable to expect that a given dollar decrease of the saving function would have about the same effect on Y as an equal dollar increase of investment demand. The latter has both a direct and a multiplier effect on Y, and so does a downward shift of S, reflecting an upward shift of $G + C$ at each level of Y. It is also reasonable to expect that a given dollar increase in the saving function, reflecting a downward shift of $C + G$ demands, would have both direct and multiplier effects on the level of Y similar to those that would result from an equal dollar decline of investment demand. Because of these similarities we can deal more briefly with shifts of the saving function.

Decrease of the Supply of Saving

Let us suppose, in Fig. 16–10, that, in the initial situation, the supply of saving is S_0S_0 and the equilibrium combination of Y and r is Y_0, r_0. Now suppose that, reflecting an increase of $C + G$ demand for output, the supply of S falls by $5 billion at each level of Y. I and S are no longer equal at the old combinations of Y and r that formerly equalized them. Now that S has fallen by $5 billion at each level of Y, they can again be equalized only by a rise of interest rates to reduce I or a rise of Y to increase S, or some combination of the two. How much would Y have

to rise at each level of r to increase S by \$5 billion? Again, this depends on the size of the multiplier $1/(\Delta S/\Delta Y)$. The new curve, $I = S_1$, shows all the new combinations of Y and r that would equalize S and I. At each level of interest rates, it is to the right of the old $I = S_0$ curve by an amount equal to the \$5 billion decrease of the supply of saving times the multiplier.

Will Y actually rise this much? It will if interest rates remain un-

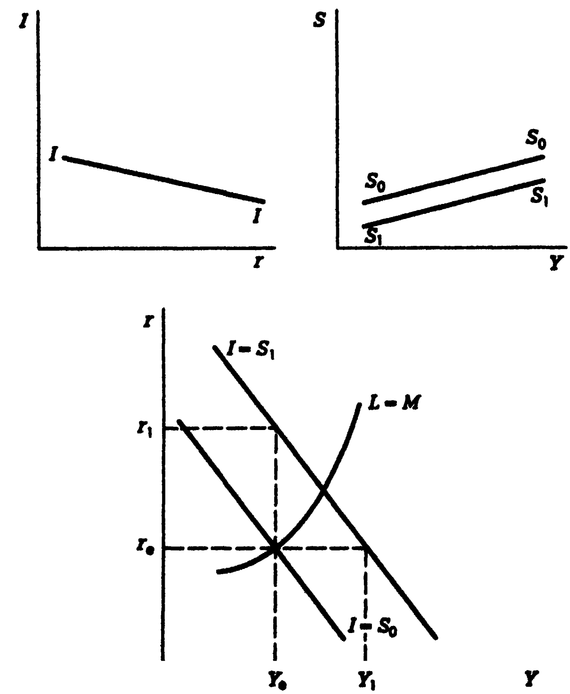

FIG. 16–10. Shifts in the Supply of Saving.

changed at r_e so that none of the adjustment can occur through a reduction of I. But suppose the $L = M$ curve is perfectly vertical at the income level Y_e. In this case, the rise of interest rates frees no money from L_2 balances and there is no rise of Y. The net effect is to raise the level of interest rates and thereby to decrease actual investment by an amount equal to the increase of $C + G$. If the shape of the $L = M$ line is between the horizontal and the vertical, the decrease in the supply of saving will raise both interest rates and the level of Y, but the rise of Y will not be so large as it would have been if interest rates had not risen. Again,

we see how dangerous it is to talk about actual multiplier effects without considering conditions relating to the supply of money and the demand for money.

Increase of the Supply of Saving

A $5 billion increase in the supply of saving at each level of Y, reflecting a decrease of $C + G$ demands for output, can be illustrated in Fig. 16–10 by the upward shift from S_1S_1 to S_0S_0. The reader will find it useful to trace out the results, noting both the necessary leftward and downward shift of the $I = S$ line and the relevance of the shape of the $L = M$ line to the outcome. He may also find it useful to answer these questions: How might monetary policy be employed to prevent or minimize the decline of Y? Through what processes would it operate? What are some possible limitations on its effectiveness?

Personal Consumption and the Supply of Saving

The supply of saving can be decreased by an increase of personal consumption demand for output at each level, and it can be increased by a decrease of C at each level of Y. Such shifts might come about in two general ways: (1) through changes in government fiscal policy that change the size of disposable private income at each level of Y (these will be considered later), and (2) through decisions of the public to spend a larger or smaller part of its disposable income for consumption. Shifts of this latter type clearly could be an important source of economic fluctuations. But are they in fact? For some time, many economists were disposed to answer this question in the negative. They noted that the rate of consumption was highly responsive to changes in disposable private income emanating from changes in investment and government spending, but they thought the consumption function itself (that is, the rate of consumption at each level of disposable private income) remained rather stable over the short run. More recently, however, the belief has grown that the consumption function is less stable than was formerly thought. In a few cases, the shift has been dramatic. For example, the fear of wartime shortages and higher prices shifted consumption sharply upward at the outbreak of the Korean conflict. Less dramatically, people may shift their consumption functions because of changed expectations concerning their future employment and incomes, the future behavior of prices, or because of changes in their asset and debt positions. For instance, if large sections of the public come to feel that their asset holdings have become too small and that they are

too heavily in debt, they may use a larger part of their current incomes for saving and a smaller part for consumption. But if they have built up their assets and reduced their debts, they may feel free to spend a larger part of their current incomes for consumption and to save a smaller part.

GOVERNMENT FISCAL POLICY

The government's fiscal policy is made up of three principal parts: its policy relative to its purchases of goods and services, its tax policy, and its policy relative to transfer payments. Partly because of the huge volume of its economic operations, the government's fiscal policies inevitably affect greatly the functioning of the economy. They may initiate or at least aggravate inflation or deflation, but they may also be used to stabilize the economy, to offset shifts of private investment-demand or private consumption functions. We shall now investigate the effects of each of these policies, starting with those relative to government purchases of goods and services.

Changes of G

Let us start from the situation indicated in Fig. 16–10, in which Y is at the level Y_e. Now, while all the other functions remain constant, including the government's policies relative to taxes and transfer payments, the government raises its demand for output at each level of Y by \$5 billion. This \$5 billion rise of G will be reflected in a decline of S by \$5 billion at each level of Y, this representing the decline of government saving $(T_n - G)$. This \$5 billion rise of G clearly raises Y by that amount. But is that the end of the story? It is not, for with the \$5 billion decline of S at each level of Y, S will no longer be equal to I at each of the Y,r combinations that formerly equalized them. I will now exceed S, and they can again be equalized only by a rise of Y to increase S or a rise of r to lower I, or some combination of the two. How much must Y increase at each level of r to increase S by \$5 billion? This again depends on the size of $\Delta S/\Delta Y$ and the multiplier. For example, if the multiplier is 5, Y will have to rise \$25 billion to raise S by \$5 billion. All the new Y,r combinations at which $I = S$ are on the $I = S_1$ line, which lies to the right of the old $I = S_0$ curve at each level of r by an amount

$$\Delta Y = \$5 \text{ billion} \times \frac{1}{\Delta S/\Delta Y}$$

This may be viewed in another way. The \$5 billion increase in the gov-

ernment's expenditures not only added that amount to the total demand for output, but also increased disposable incomes by that amount. The recipients of these increased incomes may be expected to increase their consumption expenditures, the amount depending on their marginal propensity to consume, $\Delta C/\Delta Y$. This increases the incomes of the producers of consumers' goods, who increase their consumption, and so on. These facts are very important for fiscal policy. The expansionary or contractionary effects following increases or decreases of G will not be limited to the direct effects of Y; they will also include the effects of induced increases or decreases of consumption demand. Government spending, as well as private investment spending, has its multiplier effects.

But will Y actually rise by an amount equal to the \$5 billion rise of $G\,[1/(\Delta S/\Delta Y)]$? It will if the other functions remain constant and if the interest rate does not rise and decrease private investment spending. But the very rise of G and the accompanying decline of government saving may tend to raise interest rates and lower private investment. Again, we shall see how dangerous it is to talk about actual multiplier effects without considering conditions relating to the supply of money and the demand for money. Let us consider three cases.

1. The monetary authority adamantly holds the money supply constant, so that the $L = M$ curve remains unchanged. The \$5 billion decline of government saving at the level of income Y_e tends to reduce the supply of investable funds for private investment and to raise interest rates. For example, suppose the government formerly had a tax surplus at a rate of \$5 billion a year, that this was being used to retire government debt, and that the recipients were relending it to business. This source of funds for private investment now disappears. Or suppose that the government formerly had an exactly balanced budget, so that it now has a negative saving, or a deficit, of \$5 billion a year. This new government borrowing in competition with the private sectors will tend to raise interest rates. The supply of investable funds might, of course, be maintained and interest rates prevented from rising if the community were holding very large L_2 balances that were completely responsive to r at its old level. In this case, the disgorging of money from idle balances would permit the full multiplier effects to be achieved. The entire rise of Y could be financed by activating what were formerly idle money balances. But if L_2 is less than completely responsive to interest rates, the latter must rise. In the extreme case in which L_2 is completely unresponsive to interest rates and the $L = M$ curve is completely vertical at Y_e, interest

rates must rise enough to decrease I by the amount that G has risen. There is no source of investable funds to replace those removed by the decrease of government saving.

2. The monetary authority expands the money supply just enough to prevent any rise of interest rates, but not enough to reduce interest rates. In this case, interest rates obviously do not change at all, I is unaffected, and the full multiplier effects of the rise of G are achieved.

3. The Federal Reserve buys government securities at an annual rate of $5 billion to match the rise of G. This, of course, creates reserves for the commercial banks. If the latter operate on 20 percent reserves, they may be enabled to increase the money supply by $25 billion a year. Such a huge increase of the money supply would increase the supply of investable funds much more than the decline of government saving tended to reduce it, would lower interest rates, and would induce a rise of private investment spending. This induced rise of I, as well as the rise of G, would induce increases in consumption expenditures. Such continuing increases in the money supply would, of course, be reflected in a continuing shift of the $L = M$ curve to the right and downward. The potentially explosive, inflationary results should be apparent.

Several points are illustrated by this example. (1) The actual effects of any given change in government demand for output and in government saving depend in part on monetary conditions. On some occasions, the presence of very large, inactive L_2 balances that are highly responsive to interest rates may prevent, or at least minimize, the rise of interest rates. But a decrease in government saving is likely, in the absence of an increase in the money supply, to raise interest rates. (2) If the government wishes to minimize the expansionary effects of any given increase in its expenditures, it should borrow in ways that do not involve an increase in the money supply. If it wishes to maximize expansionary effects, it should borrow in ways that do increase the money supply. Most expansive of all is the financing of expenditures by creating and issuing fiat money or by borrowing from the central bank, both of which tend to increase bank reserves and to permit a multiple increase in the money supply.

The effects of a $5 billion decrease in the government's demand for output at each level of Y, which would be reflected as a $5 billion rise in the supply of saving at each level of Y, are in general just the reverse of those described above. The decline of G would both decrease directly the total demand for output and reduce disposable incomes, thereby inducing downward multiplier effects through decreased consumption spending. After this rise of S at each level of Y, S would exceed I at each

of the Y,r combinations that formerly equalized them. They could be brought into equality again only by a fall of r to increase I or a fall of Y to decrease S, or some combination of the two. All the new combinations of Y,r that would equalize them would be on a new $I = S$ curve that lies to the left of the old $I = S$ curve at each level of r by an amount equal to \$5 billion $\times$ $[1/(\Delta S/\Delta Y)]$.

The level of income will actually fall by this full amount if interest rates and private investment spending remain unchanged. This may happen. For example, the L_2 demand for money may be completely responsive to interest rates at the old level of r, so that none of the increase in government saving appears in the market as an increased supply of investable funds and there is no downward pressure on interest rates. But if the L_2 demand for money is less than completely responsive to interest rates and the money supply remains constant, at least some part of the increase in government saving will appear in the market as an increased supply of investable funds, which will tend to lower interest rates and stimulate private investment spending. An expansionary monetary policy can, of course, increase the downward pressure of interest rates.

In the preceding discussion, we have assumed that the investment-demand function remained constant in the face of increases or decreases of government demand for output. This may be realistic if the shifts of G are not large or dramatic. But we should recognize that shifts of G may shift the investment-demand function. Suppose, for example, that the government increases markedly its demand for output and that the community expects that both the rise of G and the induced rise of C will bring large increases in demands for the output of industry. The marginal efficiency of investment may rise and with it the investment-demand function. In such a case, the total rise of expenditures for output will consist of the initial rise of G, the induced rise of I, and the induced rise of C resulting from both the rise of G and the rise of I. But in this case, as in the others discussed earlier, the actual behavior of investment spending will depend in part on monetary conditions and the behavior of interest rates. After all, I cannot rise if additional investable funds are not available.

Similarly, an initial decrease of G may, by lowering expectations concerning total demands for output, lower the investment-demand function. Any induced fall of I, as well as the initial decline of G, will tend to reduce consumption demand. Here, again, the actual behavior of I will depend in part on monetary conditions and the behavior of interest rates.

Changes in T_n

Let us now consider changes in the government's tax policy while all the other functions, including the governments' purchases of goods and services and its transfer payments, remain constant. We shall start with an increase of taxes, assuming that the government increases its tax collections at each level of Y by $5 billion. In our analysis, this will appear as a $5 billion rise of government saving at each level of income.

How can this rise of taxes affect the demand for output? It does not *directly* constitute either an addition to, or a reduction of, spendings for output. But it does lower disposable private incomes, and this initial decline of disposable private incomes is likely to decrease consumption demand at each level of Y. Will it lower C by the full $5 billion at each level of *Y*? Probably not; with lower disposable incomes, the community is likely to decrease its saving as well as its consumption. Let us suppose that for every $1.00 decrease of its disposable income, the community reduces its consumption spending by 80 cents and its saving by 20 cents. Then the $5 billion decrease of disposable private income would initially reduce C by $4 billion. But this is not the end of the story. The initial $4 billion decrease of C would reduce the incomes of those employed in the consumers' goods industries, the latter would in turn decrease their consumption, and so on. Thus, the initial $4 billion reduction of C induced by the $5 billion tax increase would have its downward multiplier effects. In our diagrams, this would appear as a leftward shift of the $I = S$ curve. The new $I = S$ curve would lie to the left of the old by an amount equal to the initial $4 billion decrease of $C\,[1/(\Delta S/\Delta Y)]$.

Several important points are brought out by this example.

1. By increasing its tax collections at each level of Y, the government can lower disposable private incomes at each level of Y.
2. This is likely to lower consumption demand at each level of Y. However, the initial decrease of C is not likely to be so large as the rise of government tax collections, for some of the taxes may be paid with income that would otherwise have been saved.
3. Any initial decline of C that does occur will have downward multiplier effects.

Here, as in other similar cases, we cannot be sure that Y will actually fall by an amount equal to the initial $4 billion decline of $C\,[1/(\Delta S/\Delta Y)]$. It will if interest rates and investment spending remain unchanged. But the very increase of government saving and the decline of the demand for money as Y falls may tend to lower interest rates and to stimulate private investment. On the other hand, the decline of consumption demand can have the further effect of lowering the investment-demand function. The outcome may differ from case to case. But of one thing

we can be fairly certain: The total effects on Y will not be only those of the initial decline of consumption.

The effects flowing from a $5 billion decrease of tax collections at each level of Y are just the reverse of those described above. Such a tax reduction would raise disposable private income at each level of Y; this would tend to increase consumption demand at each level of Y; and upward multiplier effects would follow. Thus, tax reductions may be a powerful instrument for raising expenditures for output, especially if the public uses a very large part of every increase in its disposable income to increase its rate of consumption.

We now come to the government's domestic transfer payments. These, as noted earlier, are not themselves a government demand for output, but they are a part of disposable private income. The government can therefore increase or decrease disposable private incomes at each level of Y by increasing or decreasing the amounts of its transfer payments. In general, an increase of transfer payments has effects similar to those of a decrease of taxes; both serve to raise disposable private incomes at each level of Y. Also, a decrease of transfer payments has effects similar to those of an increase of taxes; both serve to lower disposable private incomes at each level of Y. And both may be used to influence the level of demand for output.

Summary

We find, then, that the government has three principal instruments of fiscal policy: its demand for output, its tax policy, and its transfer-payments policy. It can exert an expansionary influence on the economy by increasing its demand for output, by raising its transfer payments, or by lowering taxes. It can exert a restrictive influence by decreasing its demand for output, by decreasing its transfer payments, or by raising taxes. These instruments may be used in various combinations. Used unwisely or clumsily, they can initiate or aggravate economic fluctuations. Employed wisely and skillfully, they may be effective in stabilizing the economy by offsetting shifts in private investment-demand and private consumption functions. In all cases, both direct and multiplier effects should be considered. And in all cases, current monetary conditions and monetary policy will affect the outcome. For example, the expansionary effects of increased government expenditures or decreased taxes may be at least partially offset if the supply of funds for private investment is allowed to decline and interest rates to rise. This emphasizes the usefulness of proper coordination of monetary and fiscal policies.

PRICE LEVELS AND EQUILIBRIUM

Up to this point, we have assumed that the price level of output was given and constant so that changes in Y, I, and S represented changes in real output and income. This enabled us to use the four functions to determine unique equilibrium levels of interest rates, real output or income, and the money value of output or income. The assumption of a stable price level may be realistic if all the levels of Y under consideration are below those corresponding to full employment and if money wage rates and prices are inflexible upward and downward. Under such conditions, increases and decreases in demand may indeed be reflected largely, if not wholly, in changes in the level of real output or income.

Changes of *P* with Constant *M*

We must now recognize that increases or decreases in demands for output can increase or decrease the price level of output. Moreover, changes of P unaccompanied by proportional changes in the money supply tend to change the equilibrium levels of interest rates and real income. In general, the higher the price level P, the higher will be the level of interest rates and the lower the level of real output or income.

To establish this point, we shall assume that the money supply is constant in nominal, or dollar, terms and that the demand for money balances is some constant function of the level of money income (OP) and of interest rates. This is the same type of function that we have been using. We also assume that a change in the level of prices reflects equiproportional changes of all prices. We do this because we are interested in the effects of changes in the average level of prices, not in changes in the relative heights of individual prices or classes of prices. A further assumption is that it is *real* investment demand that is some negative function of interest rates, so that money expenditures for investment at each level of interest rates vary proportionally with P. This is not an unrealistic assumption when all prices change proportionally with the cost of capital goods, leaving unchanged the percentage rate of return over cost. This assumption is reflected in Table 16–1. For example, at an interest rate of 7 percent, expenditures for investment may be \$20 billion if the price level is $P = 1$; \$30 billion if $P = 1.5$; and \$40 billion if $P = 2.0$. At an interest rate of 3 percent, investment expenditures may be \$60 billion if $P = 1.0$; \$90 billion if $P = 1.5$; and \$120 billion if $P = 2.0$.

Similarly, it is assumed that the supply of real saving is some constant function of real income. Thus, as illustrated in Table 16–1, if the nation

would save \$20 billion out of a \$100 billion money income with $P = 1.0$, it could save \$30 billion out of a \$150 billion money income with

TABLE 16–1. Investment Demand and Saving Supply at Different Price Levels (amounts in billions)

Investment Demand				Saving Supply					
(Col. 1)	(Col. 2)	(Col. 3)	(Col. 4)	(Col. 5)	(Col. 6)	(Col. 7)	(Col. 8)	(Col. 9)	(Col. 10)
Interest Rate	I at $P = 1$	I at $P = 1.5$	I at $P = 2.0$	Y at $P = 1$	S at $P = 1$	Y at $P = 1.5$	S at $P = 1.5$	Y at $P = 2.0$	S at $P = 2.0$
7%	\$20	\$ 30	\$ 40	\$100	\$20	\$150	\$ 30	\$200	\$ 40
6	30	45	60	150	30	225	45	300	60
5	40	60	80	200	40	300	60	400	80
4	50	75	100	250	50	375	75	500	100
3	60	90	120	300	60	450	90	600	120
2	70	105	140	350	70	525	105	700	140

$P = 1.5$, and \$40 billion out of a \$200 billion money income with $P = 2.0$. The same principle applies at other levels of income.

All this is shown graphically in Fig. 16–11. As before, interest rates are shown on the vertical axis. However, we now show on the horizontal axis, not real income, but the value of money income at current prices, or OP. The $L = M$ line reflects our assumption of constant money-supply and demand-for-money functions. The lowest $I = S$ line shows the various combinations of money income and interest rates that would equate investment demand and the supply of saving if prices were at the lowest level, $P = 1.0$. Note that if $P = 1$, the level of interest rates is very low. The middle $I = S$ line shows the various combinations of money income and interest rates that would equate investment demand and saving supply if $P = 1.5$. Here, the level of interest rates is higher, and the level of interest rates is still higher if prices are at the higher level $P = 2.0$.

Thus, we find that with a constant supply of money in dollar terms and a constant demand for money function, higher price levels will be accompanied by higher interest rates and lower price levels by lower interest rates. The reason is, of course, that higher prices mean higher quantities of money demanded for transactions purposes at each level of real income, leaving only smaller amounts of the money supply to satisfy L_2 demands. And the community can be induced to decrease the amount of balances demanded for L_2 purposes only by a rise of interest rates.

We have stated that, other things being given, higher price levels will be associated with higher interest rates and that an increase of prices can raise interest rates. But may not interest rates affect price levels? For

example, may not higher interest rates lower price levels? They may, indeed, if prices are flexible. Let us assume that money wage rates are flexible both upward and downward, that any unemployment will lower money wage rates, and that each decline of money wage rates induces a fall of prices. With any given investment-demand function in real terms and a given saving-supply function in real terms, there is some interest rate that will exactly equate investment demand to the amount of saving supplied out of a full-employment level of income. Suppose this is a 4 percent interest rate. There is some price level that will produce a 4 percent interest rate. This is the equilibrium price level. A glance at Fig. 16–11 shows this to be $P = 1.5$. Reference back to Table 16–1 shows that at $P = 1.5$ and an interest rate of 4 percent investment de-

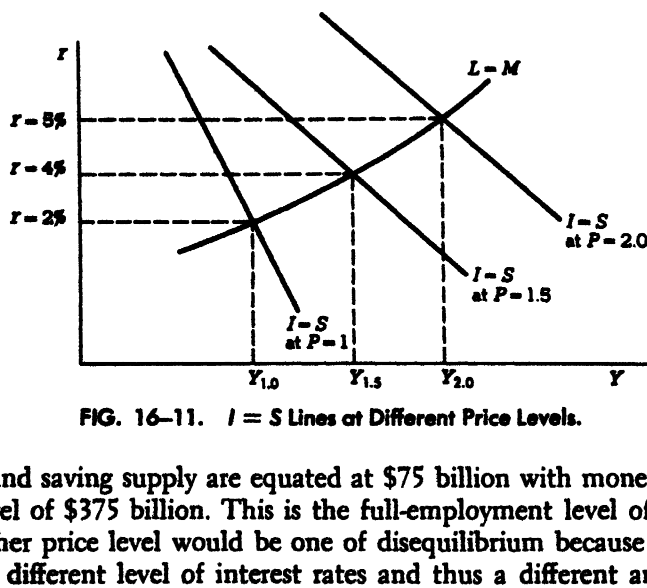

FIG. 16–11. *I = S Lines at Different Price Levels.*

mand and saving supply are equated at $75 billion with money income at a level of $375 billion. This is the full-employment level of income. Any other price level would be one of disequilibrium because it would bring a different level of interest rates and thus a different amount of investment demand.

Suppose, for example, that prices were at some higher level, such as $P = 2.0$. Interest rates would have to be higher to equate L to M, and the higher rate would reduce real investment demand. At $P = 2.0$, the interest rate would have to be 5 percent in order to equate L and M. Table 16–1 indicates that at that level of interest rates and with prices of $P = 2.0$, investment demand and saving supply would be equated at $80 billion and the level of money income would be $400 billion. But the latter is equal to only $300 billion at $P = 1.5$, for each dollar will buy only three-quarters (1.5/2.0) as much. This is considerably below the

full employment level of output, which we found to be \$375 billion at $P = 1.5$. Thus, at $P = 2.0$, there will be considerable amounts of unemployment and underutilization of capacity. If money wage rates and prices are flexible downward, unemployment will bring a fall of money wage rates, and the fall of costs will be reflected in lower prices. This process will continue until the full-employment equilibrium has been established.

On the other hand, any price level below $P = 1.5$, such as $P = 1.0$, would produce an interest rate below the equilibrium level, which would cause real investment demand to exceed the supply of real saving. For example, Fig. 16–11 indicates that with $P = 1.0$, equality of L and M and of S and I could be achieved only at the low interest rate of 2 percent. Table 16–1 shows that at a price level of $P = 1.0$ and r at 2 percent, investment demand would be \$70 billion and that this could be matched by an equal supply of saving only if income were \$350 billion. But this level of output is clearly beyond the capacity of the economy, for \$350 billion at $P = 1.0$ is equivalent to \$525 billion at $P = 1.5$, and we noted above that the full-employment level of output with $P = 1.5$ is only \$375 billion. Thus, at any price level below $P = 1.5$, interest rates would be below equilibrium levels, investment demand would exceed saving supply, and the total demand for output would exceed supply. The excess demand for output would raise prices, and the process would continue until interest rates had been raised to the equilibrium level.

Thus, with fully flexible money wage rates and prices, the price level itself will adjust in such a way as to push interest rates to the level that will equate investment demand to the supply of saving available out of a full-employment level of real income. Note the central and crucial role played by wage and price flexibility. It is probably not unrealistic to assume that money wage rates and prices are flexible upward at full-employment levels of output. This part of the price-level adjustment mechanism is likely to work.

However, we can be far less optimistic about the downward flexibility of money wage rates and prices. Suppose, for example, that prices are at some level such as $P = 2.0$, which is so high that interest rates will be considerably above the equilibrium level, and investment demand will be equated to the supply of saving only at a level of output and income considerably below full-employment levels. If prices are inflexible downward, there is within the system itself no mechanism for lowering interest rates and raising output. Unemployment and excess capacity may persist until monetary or fiscal action is taken.

Two principal remedies are available:

1. Increase the money supply to such an extent that interest rates will fall to equilibrium levels despite the persistence of the high level of prices. In Fig. 16–11 this would appear as a rightward and downward shift of the $L = M$ line. The object is, of course, to raise investment spending enough to offset the supply of saving at a full-employment level of income.

2. Use fiscal policy to decrease the saving-supply function at each level of income. This could be done by increasing government demands for output, by increasing domestic transfer payments, or by decreasing tax collections. With a smaller supply of saving at each level of income (that is, with larger government or consumption spending), the supply of saving and investment demand would be equated at a higher level of income even if interest rates did not fall.

Of course these remedies may be used in various combinations or "mixes." For example, increases in the money supply may be combined in various ways with increases in government expenditures, or tax cuts, or increases of domestic transfer payments. The combination actually chosen will depend on many things, such as political feasibility, estimates of the speed of reaction and degree of reliability, desires with respect to the division of the increased output among government use, personal consumption, investment, and so on.

This section has emphasized a point made earlier: that both monetary theory and monetary policy must take into account the characteristics of the markets for output and labor, and especially the nature of their responses to aggregate demand. If money wage rates and prices were quickly and freely flexible both upward and downward, the level, and changes in the level, of aggregate money demands for output might be of interest largely because of their effects on price levels. Actual output might be kept close to capacity levels by appropriate adjustments of the levels of money wages and prices no matter what the level of money demands for output. However, when money wage rates and prices are inflexible or adjust only slowly and after a long delay, changes in the level of money demand for output become important determinants of the levels of real output and employment.

CONCLUSIONS

There are, of course, literally thousands of things that enter into the determination of the level of real and money income and the height of the interest-rate structure. But all these can be grouped under four main headings: the investment-demand function, the supply-of-saving func-

tion, the supply-of-money function, and the demand-for-money function. Our first task was to show that the level of income and the level of interest rates are not determined independently of each other, but are determined simultaneously, and that they are determined not by one or two functions alone, but by all four functions in combination. Then we proceeded to show how a shift of each function would alter results and how the final results would depend on the responsiveness of the other functions.

Though our central interest in this book is in money and its effects on the functioning of the economy, we have tried to avoid overemphasizing the role of money and monetary policy. No one can explain fully the behavior of income and interest rates by considering money and monetary policy alone. For this purpose, we must include all those things behind the marginal efficiency of investment function and the investment-demand function; all the determinants of the nation's supply of saving at each level of income; and all the conditions affecting the amounts of money the community would elect to hold in relationship to its level of income and the level of interest rates. Moreover, monetary managers need to take all such things into consideration in formulating monetary policy. They are unlikely to know what to do if they do not understand the effects of changes in these things or how these things will respond to the various possible types of monetary policy. But, while dealing with these various other determinants, we have also insisted on including the money supply as a determinant. There is still room for much intelligent disagreement on such matters as the extent of the effects of any given change of the money supply or the degree to which manipulations of the money supply can effectively offset changes in the investment-demand function or the supply-of-saving function. But to contend that the size of the money supply is irrelevant to the outcome would be absurd.

Our technique of shifting one function at a time, assuming the others to remain constant, is one commonly used in economics. It is the economist's closest approach to the laboratory method of the physical scientist, in which all other conditions are kept constant so that the effects of changes in one variable can be isolated. This method may be realistic in many cases; it may indeed be possible to shift one function without in the process shifting others. But we should frankly recognize that this is not always true, and is not likely to be when the shifts of a function are large or dramatic. For example, a dramatic rise of government expenditures, such as might occur at the beginning of a war that is expected to be long and expensive, may raise markedly the investment-demand func-

tion and the consumption function. A sharp rise of investment demand may, especially if it portends inflation, create expectations of increased money incomes and raise the consumption function and perhaps also lower the demand for money at each level of income and interest rates. Changes of the money supply, and even expectations of future changes of it, may shift the demand for money. The most dramatic examples are those of hyperinflation in which increases of prices initiated by increases in the money supply have generated fears of still further rises in the future and have virtually eliminated the demand for money balances. In some cases, success in stopping the creation of new money has been enough to eliminate expectations of further price increases and to raise markedly the demand for money balances. Increases and decreases in the money supply, or even expectations that they will occur, may raise or lower investment demand by affecting expectations concerning future demands for output.

When shifts of one function shift other functions, the analysis becomes more complex and the results are, of course, changed. The analysis developed here should enable the reader to infer the directions in which a shift of one function may shift others and to identify the nature of the effects of such induced shifts.

Largely to avoid increased complexity, we have used some oversimplified assumptions. One of these is that the supply of saving is not responsive to the level of interest rates. Many economists believe that this involves no serious error. But they may be wrong. A rise of interest rates, especially a large one, may shift the supply of saving upward and the consumption function downward, and a fall of interest rates may have the opposite effect. If so, this is another way that restrictive or expansionary monetary policies may affect the demand for output. We also oversimplified when we assumed a single interest rate in the market and that changes in this rate reflected the tightness or ease of credit conditions. This assumption tends to obscure the fact that some interest rates move only sluggishly and that changes in interest rates are not the only method of equating the demand for investable funds with the available supply. In markets where interest rates are sluggish, especially on bank loans to their medium-sized and small borrowers, lenders often employ various types of nonprice rationing. For example, suppose banks find that their lending power is smaller than the demand for loans. Instead of raising interest rates enough to reduce demand to the level of their lending power, they may refuse to meet some loan requests, scale others down, or raise collateral requirements, or credit standards enough to eliminate the excess demand. On the other hand, when their lending power is larger

relative to demand, they may expand their loans not only by lowering interest rates, but also by relaxing their nonprice rationing and lending more generously to applicants. To assume that the full effects of more restrictive or easier monetary policies are reflected in the accompanying rise or fall of interest rates would be a mistake.

SELECTED READINGS

See references at the end of Chapter 15.

V. International Monetary Relations

17. The International Monetary System

Most of the discussion up to this point has concentrated on domestic aspects of money and monetary policy. This somewhat isolationist procedure was necessary for expositional purposes. Now, however, we shall broaden our perspective and explore such topics as these:

1. Functions of money in international transactions
2. Mechanisms of international payments
3. Exchange rates among national moneys
4. International effects of domestic monetary policies
5. International monetary policies and international monetary cooperation.

At the beginning, we shall assume a system of free multilateral payments: that all individuals and business firms are permitted to make international payments as they see fit and to exchange at will any national money for any other. The various types of official restrictions on international payments will be considered later.

FUNCTIONS OF MONEY IN INTERNATIONAL TRANSACTIONS

The basic function of money in international trade is the same as in domestic trade; that is, to facilitate specialization and exchange. Like domestic trade, international trade is esentially barter; in the final analysis, goods and services are exchanged for goods and services. But barter would be at least as clumsy and inefficient in international transactions as in domestic trade, and probably more so in view of the greater distances that are usually involved. The use of some sort of money as a medium of

exchange or payments is essential to the full development of international trade, lending, and specialization.

Moreover, international payments, like domestic payments, are facilitated by using types of money that can be transferred from payer to payee quickly, cheaply, and safely. It would, of course, be possible to make all international payments by shipping precious metals in form of coin or bullion or by shipping paper money. This would be costly and inconvenient. Freight costs would be high, the risk of loss would be ever present, and the speed of transferring payments would depend on the speed of transport facilities. To avoid such costs and inconveniences, international payments, as are domestic payments, are generally made by transferring debt (or credit) claims from payers to payees. The debts so transferred are usually deposit liabilities of banks. Many of these deposit transfers are made, as in domestic payments, by writen orders. Some of these are ordinary checks written by bank customers. Some are certified checks. Some are checks or drafts drawn by a cashier or other bank official on his own bank or some other bank. Many payments, especially very large ones, are made with orders on banks transmitted by telegraph or cable.

BANKS AND INTERNATIONAL PAYMENTS

The process of making international payments is greatly facilitated by a network of banking offices within each country and by interrelationships among the banks of the different countries. We have already seen how the thousands of banks in the United States are intertwined in a nation-wide system for clearing and collection and in a correspondent banking system. Practically every bank in the country has a correspondent relationship with a bank in New York or with some larger bank that, in turn, has a correspondent in New York. Thus, virtually every bank, even a very small one, is enabled to provide its customers who wish to make payments abroad with checks drawn on a well known New York or other metropolitan bank and even with checks drawn on foreign banks with which its city correspondent maintains close relations. In most other countries, similar results are achieved through nation-wide branch banking systems. Even small villages are served by branches of banks that have important offices, if not their head offices, in the nation's principal financial centers. Some countries have domestic-correspondent banking systems similar to that in the United States.

The financial centers and commercial-banking networks of the various countries are interconnected in two principal ways.

1. Foreign Branches. A number of the larger banks in this country, such as the Chase Manhattan Bank, the First National City Bank, the Bank of America, the Continental Illinois Trust, and the Guaranty Trust Company, operate foreign branches. Several British banks maintain branches in various parts of the world, as do banks in France, Holland, Canada, and some other countries. Foreign branches usually become members of the clearing and collection system of the country in which they are located, establish relations with banks in that country, and engage in banking activity insofar as the laws of the country permit it. For the head office and its correspondents and customers, foreign branches perform many types of services. They supply credit and market information, draw and sell drafts, collect drafts, pay drafts, accept drafts, and so on.

2. International-Correspondent Relationships. The nature of these international-correspondent relationships can be illustrated by a hypothetical example in which the Chase Manhattan Bank of New York and the Midland Bank, Ltd., of London become correspondents of each other. Under such arrangements each performs many services for the other, compensation being fixed by prior agreement or by later negotiation. Each acts for the other and for the customers and correspondents of the other in paying and collecting checks and other items, in presenting bills of exchange for acceptance, in buying and selling securities, and so on. At least one of the banks maintains a deposit account with the other, and each may hold deposits with the other. For example, Midland may hold deposits with Chase, and Chase may hold deposits with Midland. Each may agree to lend to the other up to a stipulated maximum amount. Suppose, for example, that you wish to buy £100,000 at a time when the exchange rate is £1 = $2.80. Chase may sell you such a draft on the Midland Bank even though its deposit account with Midland is depleted at the time, and Midland will pay the draft. Chase may continue to owe Midland for a time, or it may immediately purchase claims against sterling and send them to Midland to replenish its deposit account, or it may pay Midland by crediting $280,000 to the latter's deposit account in New York.

It is easy to see how this vast network of correspondent relationships facilitates international payments. Americans are enabled to make payments abroad with written, telegraphic, or cable orders drawn by their banks on American banks or on foreign-correspondent banks. And foreigners can make payments in the United States with written, telegraphic, or cable orders drawn by foreign banks on foreign- or United States-correspondent banks. It is interesting to note that a United States bank is even enabled to sell orders drawn on foreign banks with which

it has no direct correspondent relationship. Suppose that you wish to make a £10,000 payment in Sydney, Australia, but neither Chase nor any other United States bank has a correspondent there. Chase might nevertheless sell you a £10,000 draft on a Sydney bank, informing that bank that when it makes payment, its account with Midland in London will be credited an equivalent amount. In effect, you pay Chase, Chase pays Midland, Midland pays the Sydney bank, and the Sydney banks pays the Australian payee. All these payments can be made by crediting and debiting deposit accounts.

In some cases, international payments are made with money of the payer's country. For example, most United States payments abroad are made with orders drawn on United States banks and stated in dollars. The recipient of these dollars may have deposit accounts in the United States to which the dollars can be added, and he may use them directly to make payments in the United States or elsewhere. Much more commonly, however, he sells the dollars in the exchange market—probably to his own bank or to the central bank or exchange authority of his country —in exchange for the money of his own country. In some other cases, international payments are made in the money of the payee's country. For example, a Swedish merchant would usually make payments to Britain in terms of sterling. If the payer does not himself have a sterling deposit in Britain, he will have to offer his own national money in the exchange market to buy claims on sterling.

A very large volume of international payments is made with the money of a third country. Two of the principal moneys used in this way are the United States dollar and the British pound sterling. For example, payments from Argentina to France may be made by transferring deposit credits on the books of New York banks. In effect, the Argentinian payer uses pesos to buy an order on a New York bank and sends the order to pay dollars to the French payee, who sells the dollars for French francs. Someone in France may then buy the claims against dollars and use them to make payments to still other countries. It is partly to make payments to other countries as well as to the United States that foreign banks maintain large deposit accounts in this country. In a similar way, many countries make payments to each other by transferring sterling claims against British banks. This includes not only most members of the British Commonwealth, but also the Scandinavian countries and many others as well. For this and other purposes, they maintain large accounts in London. Because of their widespread use in international payments, the dollar and the pound are often referred to as the great international currencies.

FOREIGN-EXCHANGE MARKETS

International payments involve a huge volume of exchanges of national moneys for each other. For example, an American who receives a claim against French francs and who does not want to spend in France or to hold French francs will offer them in exchange for dollars or for some other nation's money that he wants to spend or hold. Other Americans who want to spend or hold moneys of other nations offer dollars in exchange for them. Similar transactions occur all over the world. The term *foreign-exchange market* refers to all the facilities and processes involved in the exchange of claims against the various national moneys. The things bought and sold include small amounts of coin and larger amounts of paper money, but the great bulk of trading is in claims against banks denominated in the various national moneys. Some of these are payable on demand; others, only after a lapse of time. Short-term claims against nonbank debtors are also exchanged in these markets.

Like all efficient markets, foreign-exchange markets have their middlemen. These are of several types. In some cases, as in New York, most of the business is done by the foreign-exchange departments of commercial banks, which buy and sell on their own account. Some countries have types of banks that specialize in foreign-exchange operations. Most have at least some nonbank dealers, who buy and sell on their own account, and brokers who bring buyers and sellers together. Moreover, as will be stressed later, central banks often participate in these markets, as do also exchange stabilization funds in countries that have them.

Virtually all countries have some sort of foreign-exchange market, but some are more highly developed than others. Among the largest and most active are those in New York, London, Paris, Amsterdam, Brussels, Zurich, Frankfurt, and Rome. These are closely interlocked through international-branch-banking and correspondent-banking systems and by telephone, telegraph, and cable. Very large purchases in one market and sales in another can be effected quickly and cheaply. Thus, in the absence of official restrictions, exchange rates in the various markets can differ only slightly. Exchange arbitrage, the simultaneous purchase in one market and sale in another, prevents wide differences.

MULTILATERAL PAYMENTS AND MULTILATERAL TRADE

In the first chapter, we noted that one of the great advantages of using money in trade is that it enables each person or firm to sell to those who offer the highest price and to buy from those who offer the best bargain.

This not only enables each entity to make the most of his available resources, but also promotes maximum output by helping each person, firm, and region to specialize in the production of those things in which it has the greatest comparative advantage. This is just as true internationally as it is domestically. To make its maximum contribution to world trade and world productivity, an international monetary mechanism must enable buyers to purchase and sellers to sell in the most favorable markets; it must not force Nation A to buy from Nation B simply because the latter bought from it or lent to it.

Let us see how unrestricted exchange markets facilitate multilateral trade and multilateral payments. Suppose that the United States exports £1 million worth of wheat to England and receives sterling in return. Our exporters will sell the sterling claims to banks for dollars, and the banks are thus put in a position to sell sterling to others who wish to make payments abroad. The United States may not want to buy in England, but does want Brazilian coffee, and may therefore buy checks or drafts on sterling deposits in London and remit them to Brazilian coffee exporters. These exporters sell their sterling claims to their banks for cruzeiros, and thus the Brazilian banks have sterling for sale. Brazilian importers may buy the sterling and use it to buy women's clothing in France. French exporters sell the sterling to French banks, which may then sell it to French importers, who use it to buy British industrial products. This example, admittedly simpler in its explanation than in many actual cases, illustrates the principles of multilateral trade and multilateral payments. No two of the countries balanced their trade with each other; England bought from us, we bought from Brazil, Brazil bought from France, and France bought from England. Through an unhindered exchange of money, each nation was enabled to sell in the most favorable market and to buy in the most favorable market the things it wanted most. This freedom of buyers also tended to cause producers to adjust their production to the desires of buyers and to locate the production of each commodity in the area or areas that could produce it most cheaply.

Free-exchange markets also permit borrowers to use the proceeds of international loans in ways that they consider most advantageous and which will promote the most efficient types of specialization and production. Suppose, for example, that a French public-utility company borrows $50 million in New York because interest rates are relatively low there. This company may wish to buy only domestic labor and equipment and may therefore sell the dollar proceeds of the loan for francs. Other Frenchmen may remit the dollars to Argentina for needed foodstuffs and raw materials, and an Argentina railroad may use the dollars to buy

United States locomotives. In the final analysis, the loan enabled France to increase its imports, but it imported what it wanted most and from the most favorable world market. Our loan to France increased our exports, but to Argentina rather than to France. We shall see later how various types of exchange control inhibit the multilateral payments system, discourage multilateral trade, and impede international specialization.

INTERNATIONAL FLOWS OF RECEIPTS AND PAYMENTS

As already noted, each nation makes most of its payments to other countries by transferring to them deposit claims against banks. But how do the members of a nation acquire these deposit claims with which to pay other countries? The answer is that they rely largely on a flow of receipts from other countries. To explain this, consider first the case of a country whose money other nations are not willing to hold in large quantity, and which receives in payment claims against foreign banks, and which pays with claims against foreign banks. As will be seen later when we study balances of international payments, each nation enjoys a flow of receipts from other countries. A major part of these receipts is usually in payment for its exports of goods and services, but these receipts may be supplemented by selling securities to the rest of the world, by borrowing or by receiving gifts and grants. This flow of receipts provides the nation with deposit claims against other countries and is the major source of its ability to pay other countries.

The same is true in essence of a nation whose money is an important international currency. For example, the United States pays other countries primarily by giving them dollar-deposit claims against American banks and it receives payment from them primarily in the form of claims against American banks. Other countries are willing to hold very large amounts of claims against dollars, but unhappily this amount is not unlimited. As we make payments to the rest of the world, giving in payment deposit claims against American banks, we build up our stock of short-term debts in this form to the rest of the world. But our flow of receipts from the rest of the world transfers ownership of these deposits from foreigners to Americans, thus tending to decrease our short-term debts to other nations. Thus we, too, rely largely on our flow of receipts to make payments to others, for it is primarily this flow that prevents our stock of short-term debts to other countries from rising above the amounts they are willing to hold.

In short, the major source of each nation's capacity to make payments to others is its flow of current receipts from them. However, the members of a nation might find it inconvenient, or worse, if this were the only source of its capacity to make international payments so that in each period it could spend in the rest of the world no more than its current flow of receipts. These receipts may at times dwindle because of failure of the nation's principal export crops, or unfavorable conditions in export markets, or for other reasons. To decrease its international purchases and payments quickly to match the decline of receipts may create hardships. Or, because of crop failures or for other reasons, a nation may wish to purchase extraordinarily large amounts abroad during some period.

Thus, the members of a nation collectively need a capability of spending abroad for some time in excess of their flow of receipts from abroad. This is comparable to an individual's need for a stock of money balances to bridge the gap of an excess of expenditures over receipts during some future period. In this case, however, the nation requires command over something that will be acceptable in payment in other countries. It needs some source of "liquidity" in addition to its flow of receipts.

INTERNATIONAL "LIQUIDITY"

This need for something with which to bridge a possible or expected excess of payments to other nations over receipts from them during some future period raises some of the most difficult and controversial questions in the field of international monetary policy. These include:

1. How much "international liquidity" do nations need, both individually and collectively? This obviously depends in part on the behavior of flows of receipts and payments, for these determine the size of the "payments gap" that will need to be bridged. The amount of "needed liquidity" may be small indeed if a nation is willing, when faced with an excess of payments over receipts, to take quick and effective action to increase its receipts, decrease its payments, or both. However, needed liquidity may be very large if a nation takes no steps to remedy an excess of payments, and especially if it follows policies that tend to enlarge and prolong the excess payments. But the remedies for an excess of payments over receipts often present serious problems, for they involve such things as lowering the exchange rate on the nation's money, raising interest rates, or lowering domestic income or price levels.

2. On what sources of liquidity should nations rely? To what extent on holdings of assets in the form of foreign money or things that can be readily exchanged for foreign money, and to what extent on arrange-

ments for borrowing foreign money when needed? What forms of assets and in what proportions? What types of borrowing arrangements?

3. Who should manage the international liquidity positions of nations individually and collectively? To what extent should this be done by private sectors, by individual central banks and governments, by central banks in cooperation, and by international institutions?

Sources of International Liquidity

As suggested above, a nation may prepare against a future excess of its international payments over its receipts in two principal ways: (1) by holding a stock of assets in the form of claims against foreign moneys or other things that can be readily exchanged for foreign moneys, and (2) by arranging facilities to borrow foreign moneys when needed.

Gold has long been popular as a form of international reserves. This may be largely for historical reasons, and if history had been different, some other asset or group of assets might serve as well or better. In fact, however, gold does represent generalized purchasing power over the moneys of almost all nations because the monetary authorities of those countries stand ready to buy it in unlimited quantities, giving their money in exchange. Moreover, they rarely decrease the price they will pay for gold and they sometimes raise it. These facts make gold an attractive form of international reserve. However, gold does have some disadvantages for its holders. Perhaps most important, it yields no interest or other explicit income. Also, its shipment to make payments is expensive and requires time. It should not be surprising, therefore, that nations have sought some form of asset that would be as good as gold, or almost as good, in terms of acceptability and better because it would avoid the inconvenience and cost of shipping gold and would yield an income.

Many countries now hold at least some part of their international reserves in the form of claims against foreign moneys. The United States dollar is by far the most important "international reserve currency"; next in importance is the British pound sterling. Smaller amounts of the moneys of several other countries are held for this purpose, and these may increase in the future. These claims against dollars and other reserve currencies take several forms: deposit claims against the central bank, demand deposits at commercial banks, time deposits, Treasury bills and other short-term government securities, acceptances, and so on. Their owners usually hold in the form of demand deposits and other nonearning claims only such amounts as they need for working purposes, and the remainder in earnings assets.

Thus, income-yielding claims against a foreign money may be considered superior to gold as an international reserve as long as that money is freely convertible or exchangeable into the moneys of other nations and there is confidence that it will not depreciate in terms of gold or of other moneys. But, if fears arise that the money will depreciate in terms of gold or of other moneys, foreign holders of claims against it may exercise their right to demand gold, thereby subjecting the gold-losing country to deflationary pressures and decreasing the total international reserves of the world. Thus, an international reserve system depending heavily on claims against national moneys can create problems not only for the country whose money is used as a reserve but also for the world's monetary system.

Ability to borrow foreign moneys when needed can be at least a partial substitute for holding assets as an international reserve. It may be a very attractive substitute if a nation is assured that very large amounts can be counted upon, that interest costs will be low, and that no onerous terms will be imposed. However, it becomes an inferior substitute to the extent that prospective loans of foreign money are limited in amount, unreliable, expensive, and on onerous terms. We shall later study several existing and proposed schemes for lending foreign moneys to countries with deficits in their balances of payments and shall find that important policy problems are involved in determining what amounts, for what purposes, for what periods, at what interest rates, and on what other terms a nation should be permitted to borrow.

We now come to this question: Who should serve as custodian and manager of international reserves and take responsibility for borrowing foreign moneys when needed for international payments? Private banks and other parts of the private sector usually do this to some extent. Thus, banks often hold some claims against foreign moneys, and in the past they sometimes held gold. Moreover, banks and other business firms may have some capacity to borrow foreign moneys. However, most countries do not rely heavily on the private sectors for this purpose, for two principal reasons. First, private banks and other business firms are likely to find it unprofitable to hold gold and claims against foreign moneys in amounts sufficient to meet the needs of the nation as a whole. Second, it often proves difficult to mobilize private holdings and to use them to make international payments in time of need, and especially in time of crisis. For such reasons, the functions of serving as custodian of international reserves and as manager of international reserve positions has fallen largely on central banks, governments, and international institutions.

ROLES OF CENTRAL BANKS

One of the earliest functions of central banks was to serve as custodian of the nation's international reserves and as manager of its international reserve position. The central bank held a gold reserve and sometimes claims against foreign moneys, and used these to regulate the behavior of the exchange rate on the nation's money. If the exchange rate on its money tended to fall below desired levels (that is, if exchange rates on other moneys tended to rise above desired levels), the central bank would provide more foreign money to limit or to stop the rise. One way of doing this was to sell some of its claims against foreign moneys or to sell gold to other countries and then sell the foreign moneys that it received. Another was to sell gold to banks or others who would sell the gold abroad and then sell the foreign-money proceeds. On the other hand, when the exchange rate on the nation's money tended to rise above desired levels, the central bank provided more of the nation's money in exchange markets by purchasing gold or claims against foreign moneys.

Before the 1930s, the central bank was usually the principal, and often the sole, custodian of a nation's centralized international reserves. Since that time, many countries have transferred at least a part of this function to a government agency called by such names as "exchange stabilization funds" or "exchange equalization accounts." These agencies hold at least some part of the nation's gold and foreign-currency reserves, and buy and sell in exchange markets. In most cases, however, central banks manage these agencies.

The responsibility of a central bank usually does not end with serving as custodian of a nation's international reserves and using these for operations in exchange markets. It also includes managing the size of the nation's international reserves and the state of its international-reserve position. A common responsibility is that of assuring that its international-reserve position is adequate to meet demands for foreign payments without an undesired decline of the exchange rate on its money. For example, if its international reserves threaten to become inadequate, the central bank restricts credit and raises interest rates. This serves to decrease credit outflows and even to attract inflows, and perhaps also to increase exports relative to imports by lowering domestic price and income levels. We shall later encounter several instances in which such policies conflict with the promotion of domestic objectives of promoting high levels of employment and high rates of growth.

Central banks and central bankers have also played important roles as agencies for international monetary cooperation. Prior to the 1930s,

when governments themselves were unwilling to assume much responsibility in this field, central banks were almost the sole agencies of monetary cooperation. Under the leadership of Montagu Norman of the Bank of England and Benjamin Strong of the Federal Reserve Bank of New York, central bank cooperation became frequent and useful, though not always successful. After the 1930s, the relative role of central bankers in this field declined somewhat as governments assumed more responsibility and as new international monetary institutions were established. In the early 1960s, there has been a resurgence of central-bank cooperation. Now, however, central bankers operate closely with governments and international monetary institutions, and especially with the Bank for International Settlements and the International Monetary Fund.

Central-bank cooperation takes many forms. For example, central banks sometimes attempt to adjust their domestic monetary and credit policies in such a way as to help other countries, insofar as this can be done without undue sacrifice of their domestic interests and objectives. They also cooperate in certain types of operations in both spot and forward exchange markets, which will be discussed later. Here we shall concentrate on two closely related forms of cooperation. One relates to central-bank holdings of claims against foreign moneys and the terms and conditions under which the central-bank holders will demand payment in gold. Though full information is not available, it is clear that central banks sometimes agree to continue to hold claims against foreign moneys, and even to increase their holdings of these claims, instead of exercising their legal right to demand payment in gold. In other words, they agree to continue lending and even to increase their lending to the country or countries against whose money they hold claims. This is clearly a source of liquidity to the beneficiary country.

Central banks also make other types of loans to each other. In some cases, these are bilateral transactions; in others, large numbers of central banks are involved. For example, ten or even more central banks sometimes participate in a loan to a country experiencing or threatened with a crisis in its balance of payments. Central banks also enter into "swap agreements," in which one agrees to give the other a certain amount of its money in exchange for an equivalent amount of the money of the other and in which each allows the other free use of the swapped money as it is needed. For example, the United States agreed to swap up to $500 million for an equivalent amount of British pounds, and Britain could use the dollars as needed and the United States could use the pounds as needed. In mid-1963, the United States had outstanding swap agreements totaling about $1.6 billion.

All these loans and agreements to lend are important sources of international liquidity. They can become even more important if countries agree to increase the amounts that they will lend and to make firm commitments to lend. They could even make it unnecessary for countries to hold large amounts of assets as international reserves. Suppose, for example, that every financially important country agreed that when it had an excess of international receipts over its international payments, it would lend the excess to countries in the reverse situation. Under these conditions, the world's trade and payments could be carried on with a minimum of international reserves in the form of assets. We have yet to see how far these lending agreements among central banks and governments will develop and what limitations will be imposed on borrowers.

Let us now examine the role of the principal international monetary institution.

THE INTERNATIONAL MONETARY FUND

The International Monetary Fund is one of two international financial institutions established in 1946, following plans agreed upon in July, 1944, by experts from 44 nations meeting in Bretton Woods, New Hampshire. The other is the International Bank for Reconstruction and Development, popularly known as the World Bank. The major purpose of the World Bank is to promote and supplement the international flow of long-term funds for reconstruction and development. Its emphasis in the early postwar years was on reconstruction of areas damaged by the war. In more recent years, it has emphasized long-term loans to underdeveloped countries. It operates in two principal ways. The first, which has turned out to be the more important, is by selling its own bonds in the principal money centers and lending the proceeds. The second is by guaranteeing loans made by others. By 1963 the Bank had lent a total of $6.8 billion.

Purposes of the International Monetary Fund

The broad purposes of the Fund, as stated in Article I of the Bretton Woods agreement, are:

1. To promote international monetary cooperation through a permanent institution which provides the machinery for consultation and collaboration on international monetary problems.
2. To facilitate the expansion and balanced growth of international trade, and to contribute thereby to the promotion and maintenance of high levels of employment and real income and to the development of the productive resources of all members as primary objectives of economic policy.

3. To promote exchange stability, to maintain orderly exchange arrangements among members, and to avoid competitive exchange depreciation.
4. To assist in the establishment of a multilateral system of payments in respect of current transactions between members and in the elimination of foreign-exchange restrictions which hamper the growth of world trade.
5. To give confidence to members by making the Fund's resources available to them under adequate safeguards, thus providing them with opportunity to correct maladjustments in their balance of payments without resorting to measures destructive of national or international prosperity.
6. In accordance with the above, to shorten the duration and lessen the degree of disequilibrium in the international balances of payments of members.

A few of these require emphasis and elaboration.

1. Re-establishment of a System of Free Multilateral Payments and Reduction of Other Barriers to Trade and Payments. During the Great Depression, many countries had adopted various types of exchange restrictions —limitations on freedom to make payments to other countries. Many of these limited not only the total amounts of payments that could be made abroad, but also the types of payments, the countries to which they could be made, and the types of goods and services that could be bought. Some countries, and especially the belligerents, tightened their exchange controls during World War II. Other restrictions on trade were also widespread—not only tariffs but also various types of quantitative controls. One purpose of the Fund, therefore, was to eliminate exchange restrictions as fast as possible, except those on abnormal capital movements, and to work toward lowering other trade barriers. Progress in removing exchange restrictions was very slow during the first decade following the war, but rapid thereafter. Since 1958, a system of relatively free multilateral payments has prevailed.

2. Provision of an Orderly System for Setting and Altering Exchange Rates. During the Great Depression exchange rates fluctuated widely, sometimes in a disorderly manner, and some countries engaged in competitive exchange rate depreciation in efforts to increase their exports, decrease their imports, and achieve economic recovery at home in a true "beggar-my-neighbor" fashion. Many feared that exchange-rate behavior in the postwar period would again be chaotic. The Fund agreement provided that each member country establish with the Fund an initial exchange rate, and that the exchange rate should thereafter be kept within narrow limits except when the Fund gave permission for a change "to correct a fundamental disequilibrium." It is important to note that the Fund agreement rejected the principles of floating or freely flexible exchange rates and of frequently changing pegged rates, and adopted the principle of stable exchange rates with adjustments only when necessary "to

correct a fundamental disequilibrium." The importance of this decision will become apparent as we consider exchange-rate theory and policy.

3. Provision of Financial Aid to Member Countries Needing Assistance to Meet Actual or Threatened Deficits in Their Balance of Payments. It is in this function of the Fund as a source of international liquidity that we are especially interested here.

Financial Aid by the Fund

The transactions through which the Fund makes foreign moneys available to a member are not called "lending"; they are called *sales* of currencies, or "drawings on the Fund." The drawing country gets foreign money and gives in return an equal amount of claims on its own money. Nevertheless, this is in effect a loan transaction, for the claims the Fund receives against the country are only debts. It is also important to note that the Fund does not manufacture the money that it lends. It is not an international central bank with power to create money. It can only lend the gold and various national moneys that are contributed to it by its member countries. Each member country has its "quota." These quotas are important for three reasons. In the first place, a country's quota indicates the amount of that country's gold or money put at the disposal of the Fund. In the second place, its quota is a basis for determining the amount of the moneys of other countries that a country can draw from the Fund. In the third place, a country's quota determines its voting power in the Fund.

By the end of April, 1963, the Fund had 82 members and had received from them about $15.2 billion in total resources. This includes an increase of over 50 percent in member-country quotas in 1959. Countries normally pay 25 percent of their quotas in gold, and the remainder in claims against their own moneys. Table 17–1 shows that the quota of the United States is by far the largest, making up about 27 percent of the total. Next in size is the United Kingdom quota, which makes up about 12 percent of the total. From its inception in 1947, and through April, 1963, the Fund had lent a total of more than $6.8 billion, and the largest single drawer was the United Kingdom. A total of 47 countries had drawn on the Funds at least once. Its largest sales were of United States dollars, followed by Deutsche marks, pounds sterling, French francs, and Netherlands guilders.

The Fund's sales of currencies were on only a modest scale during its early years. From its inception in 1947, and through 1955, these sales totaled only $1.2 billion. However, from the end of 1955 through April, 1963, they amounted to $5.6 billion. In 1961, a year of monetary dis-

TABLE 17–1. International Monetary Fund Quotas and Sales of Currencies (amounts in millions of dollars)

Country	Quotas as of April 30,1963	Drawings on the IMF, 1947 Through April, 1963	Types of Currencies Sold by the IMF, 1947 Through April, 1963	
United States	$ 4,125.0	$	Dollars:	$4,206.5
United Kingdom	1,950.0	2,361.5	Pounds sterling:	$614.7
France	787.5	518.8	Francs:	$464.0
Germany	787.5	.....	Marks:	$740.4
India	600.0	575.0		
Canada	550.0	300.0	Dollars:	$100.0
Japan	500.0	249.0	Yen:	$80.0
Netherlands	412.5	144.1	Guilders:	$214.5
Australia	400.0	225.0		
Belgium	337.5	83.0	Francs:	$133.4
Argentina	280.0	352.5	Pesos:	$16.0
Brazil	280.0	.....		
Italy	270.0	.....	Lire:	$225.2
Spain	150.0	50.0	Pesetas:	$715
Sweden	150.0	.....	Kronor:	$35.0
Denmark	130.0	44.2	Kroner:	$0.8
Total of 66 other countries	3,522.0	1,573.9	Austrian shillings:	$7.5
Total	$15,232.0	$6,845.4		$6,845.4

SOURCE: International Monetary Fund, *International Financial Statistics*, June, 1963, pp. 2–5.

turbances, they were nearly $2.5 billion. Table 17–2 reveals that there have been important changes in the proportions of the various national moneys sold by the Fund. Through 1957 almost all these sales were United States dollars. Since that time, large amounts of other currencies have been supplied, especially Deutsche marks, sterling, and French francs. In part, this reflects changes in the international positions of the various currencies. During the early period, the dollar was in greatest demand, the United States was still in a very strong international-reserve position, many important currencies were not yet freely convertible or exchangeable into other currencies, and many countries were in weak reserve positions. In contrast, the reserve position of the United States is now weaker, most of the other important currencies have become freely convertible into other moneys, and some countries (notably Germany, France, Italy, and the Netherlands) have achieved strong reserve and balance-of-payments positions. In part, however, the changed composition of its sales represents a change in policy by the Fund. It now tends to sell, not the particular national currency that a borrowing coun-

try wants to hold or spend, but the freely convertible currency of some country that is in a highly favorable reserve and balance-of-payments position. Thus, the Fund is becoming an important medium for channeling the moneys of countries with a surplus in their balances of payments to countries with deficits.

TABLE 17–2. Fund Sales of Currencies, 1947–1963
(amounts in billions of dollars)

Currency	1947–1957 Total	1958	1959	1960	1961	1962	1963 Through April	Total
U.S. dollars	$2663.6	$252.2	$138.5	$148.5	$ 822.0	$109.6	$72.1	$4206.5
Deutsche marks	4.4	64.5	7.0	0.2	503.6	115.6	5.0	740.4
French francs	....	....	12.5	5.0	344.5	97.0	5.0	464.0
Pounds sterling	191.7	16.2	21.8	67.8	113.1	199.2	5.0	614.7
Italian lire	....	....	....	....	215.2	5.0	5.0	225.2
Netherlands guilders	....	5.0	....	17.5	162.0	30.0	....	214.5
Belgian francs	11.4	....	....	....	102.0	20.0	....	133.4
Canadian dollars	15.0	....	....	....	85.0	....	....	100.0
Japanese yen	....	....	....	....	80.0	....	....	80.0
Swedish kroner	....	....	....	....	35.0	....	....	35.0
Argentina pesos	....	....	....	....	16.0	....	....	16.0
Austrian schillings	....	....	....	....	....	7.5	....	7.5
Spanish pesetas	....	....	....	....	....	....	7.5	7.5
Danish kroner	....	....	....	0.8	....	....	....	0.8
Total	$2886.1	$337.9	$179.8	$279.8	$2478.5	$583.8	$99.6	$6845.4

SOURCE: International Monetary Fund, *International Financial Statistics*, June, 1963, p. 4.

Under what terms and conditions will the Fund provide foreign moneys to a country? This has presented serious policy problems. From the beginning, there has been agreement on these general principles:

1. The Fund should not provide long-term funds, but should confine itself to making shorter-term loans to help a country meet deficits in its balance of payments and to give it time to eliminate those deficits. Borrowings should be repaid within three to five years, if not sooner.
2. Borrowing from the Fund is a privilege and not a right, and the Fund should lend only when the borrower is following, or promises to follow, sound policies that will eliminate its deficit.

In its earlier years, the Fund tended to be very strict in determining both the amounts it would lend and the conditions under which it would lend. Its policies are now much more liberal. For one thing, it will now lend to a country to meet abnormal capital outflows, whereas this was forbidden in the earlier years. Since 1952, it has stood ready to enter into

standby agreements with countries, in effect giving them a line of credit on which they can draw if needed. The mere existence of a widely publicized standby agreement tends to restore confidence in the exchange rate on a money and to retard capital outflows. Perhaps the most important change, however, is in the general attitude of the Fund, which is to give applicant countries more benefit of any doubts concerning their requests.

Stated in general terms, a member's drawing rights on the Fund are as follows:

1. It may draw "essentially automatically" an amount not in excess of its "Gold Tranche" position, normally 25 percent of its quota.
2. It is given "the overwhelming benefit of the doubt" on requests for amounts not in excess of its quota. If the Fund has made net sales of the nation's currency, the nation may draw under this provision an amount equal to its quota plus these net sales.
3. It may draw further amounts by presenting justifications acceptable to the Fund.

Thus, the United States, with its quota of $4.1 billion, could draw more than $1 billion "essentially automatically." It would be given "the overwhelming benefit of the doubt" on drawings up to $4.1 billion plus any amount of net sales of dollars by the Fund. In April, 1963, this totaled $5.2 billion. And it could draw still more if the Fund found its reasons acceptable. The United States had recourse to the Fund for the first time in July, 1963, when it received a $500-million standby credit.

The drawing rights described above relate to the Fund's $15.2 billion of resources contributed by member-countries' quotas. The Fund may also borrow from its members. In 1962, 10 major industrial countries agreed to lend to the Fund up to $6 billion. As of mid-1963, the Canadian government had not yet ratified the loan agreement. However, the other nine countries had, and their agreements to lend now total $5.8 billion. These agreements to lend are not unconditional. For one thing, any funds lent may be relent by the Fund only to one or more of the countries signatory to the agreement, not to other members of the Fund. Moreover, each loan to the Fund is subject to approval by the lending countries. However, this is considered an important addition to the resources at the disposal of the Fund, especially for meeting short-term credit movements from and among the countries that are financially important. From these funds, the United States could draw up to $3.8 billion ($4 billion, if Canada ratifies the agreement) in addition to its drawing rights related to its quota at the Fund.

There also exist several more limited arrangements for international

monetary cooperation and lending, such as those among the Scandinavian countries and through the Bank for International Settlements in Basle. These will not be discussed here.

TABLE 17–3. Fund Borrowing Arrangements as in June, 1963
(amounts in millions of dollars)

Lending Country	Amount of Commitment
United States	$2000
United Kingdom	1000
Germany	1000
France	550
Italy	550
Japan	250
Netherlands	200
Canada	200
Belgium	150
Sweden	100
Total	$6000

SOURCE: International Monetary Fund, *International Financial Statistics*, June, 1963, pp. 2–3.

AN OVER-ALL VIEW

In summary, the principal components of the international monetary system are commercial banks; other institutions, such as brokers and dealers in foreign-exchange markets; central banks and exchange-stabilization funds; and some international monetary institutions, of which the International Monetary Fund is by far the most important. At the center of the mechanism are the commercial banks of the various countries, interconnected through foreign branches and a complex network of correspondent relationships. The principal medium of payments internationally is the same as that domestically: deposit claims against banks. Most international payments are made by transferring deposit claims against banks, and the banks operate this mechanism. For each nation, the principal source of these means of paying other countries is its flow of receipts from them. However, almost all countries want to prepare against a possible excess of payments over receipts in the future. For this purpose, they demand a stock of assets in the form of foreign moneys or of things that can be readily exchanged for foreign moneys, a capacity to borrow foreign moneys when needed, or some combination of the two.

Commercial banks often perform these functions in some degree. Many of them hold some foreign balances, have a capacity to borrow abroad, and lend abroad. However, a major part of the function of holding international reserves and of managing international-reserve positions has devolved upon central banks, governments, and international institutions. Central banks and governments hold a stock of international reserves and use them in buying and selling moneys in foreign-exchange markets. By selling foreign moneys or gold with which to acquire foreign moneys that can then be sold, they can limit or even prevent increases of exchange rates on foreign moneys in terms of their own money. And, by purchasing gold or foreign money, offering their own money in exchange, they can limit or even prevent decreases of exchange rates on foreign moneys in terms of their own money. When their policies are to hold exchange rates within narrow limits, they act as stabilization agencies in exchange markets.

Table 17–4 shows the amounts and forms of the international reserves

TABLE 17–4. Official Gold and Foreign-Exchange Reserves, End of 1962 (amounts in billions of dollars)

Country or Area	Total Gold and Foreign Exchange	Gold	Foreign-Exchange Total
United States	$16.2	$16.1	$ 0.1
United Kingdom	2.8	2.6	0.2
Canada	2.5	.7	1.8
Germany	6.4	3.7	2.7
France	3.6	2.6	1.0
Italy	3.4	2.2	1.2
Netherlands	1.7	1.6	0.1
Belgium	1.6	1.4	0.2
Others, continental Europe	8.3	4.7	3.6
Others, sterling	7.1	1.1	6.0
Latin America	2.3	1.2	1.1
The rest of world	5.5	1.4	4.1
Total, all countries	$61.4	$39.3	$22.1

SOURCE: *International Financial Statistics*, June, 1963, pp. 17–19.

of central banks and governments as of the end of 1962. The total for all countries, excluding the U.S.S.R., mainland China, and some communist satellites, was $61.4 billion. About 64 percent of this was in gold, but $22.1 billion, or 36 percent, was in the form of claims against foreign moneys. For all countries except the United States, their foreign-

exchange holdings made up 48 percent of their total official reserves. About $12 billion, or 54 percent of all foreign-exchange reserves, were claims against dollars. Choices as to the composition of their official reserves differ widely from country to country. For example, the United States and the United Kingdom hold most of their reserves in gold, though both are beginning to hold more foreign exchange; on the other hand, Canada holds 72 percent of its official reserves in foreign exchange; all are sterling countries except the United Kingdom, 84 percent; and countries included in "rest of world," 74 percent.

These statistics highlight several important facts: the importance of gold as an international reserve, the heavy dependence of the world on foreign-exchange holdings as international reserves, and the role of the dollar as an international-reserve currency.

Countries do not rely solely on their stocks of assets in the form of gold and claims on foreign moneys to provide international "liquidity." These are supplemented by various types of borrowing arrangements. Many of these are *ad hoc* and informal. Thus, some governments borrow foreign moneys on occasion, and central banks lend to each other from time to time. Other types, such as swap agreements, are more formal. Then there is the International Monetary Fund, with $15.2 billion of gold and claims against national moneys contributed by its members and agreements to borrow up to $5.8 billion more from the United States and eight other industrial countries. Thus, the IMF could command $21 billion of national moneys, which is equal to a third of the international reserves held by all countries.

INTERNATIONAL POSITION OF THE DOLLAR

Let us now look briefly at the roles of the United States and the dollar in the international monetary system. Claims on dollars are a major component of the international reserves of other countries. As shown in Table 17–5, these amounted to $11.9 billion at the end of April, 1963. However, the dollar is not only an international-reserve currency for foreign central banks and governments; it is also an important international medium of payments, used in payments among other countries as well as in payments between the United States and other countries. It is largely for this reason that foreign banks and other private holders held $8.4 billion of short-term dollar claims. Thus as "banker to the world," provider of international reserves, and provider of an international medium of payments, we have incurred huge short-term dollar

liabilities to other countries. At the end of April, 1963, these amounted to $20.3 billion.

TABLE 17–5. United States Short-Term Dollar Liabilities to Foreigners, April 30, 1963
(amounts in millions of dollars)

Owed To:	Amount
Foreign central banks and governments	$11,906
Other foreign holders	8,390
Total owed to foreign holders	$20,296
International institutions	5,017
Total	$25,313

SOURCE: *Federal Reserve Bulletin*, June, 1963, p. 862.

On the same date, the international reserves of the United States consisted of $15.9 billion in gold and $155 million in foreign exchange, the total of which was about $4 billion less than our short-term dollar liabilities. Was this an "unsound" situation? Unsound or not, it is typical of a country that is at the center of a gold exchange-standard system and banker to the world. One of the purposes of a gold exchange standard is to "economize gold," that is, to increase total international reserves by counting as reserves not only gold itself but also claims against gold. If every dollar claim were backed 100 percent by gold, it would not represent any net addition to the world's stock of international reserves. Moreover, the fractional-reserve principle is basic to banking. Banks and bankers operate on the assumption that all their creditors will not demand payment simultaneously.

The capacity of the United States to meet its short-term liabilities is not limited to its holdings of gold and foreign exchange. These are supplemented by various borrowing arrangements.

1. The United States IMF quota of $4.1 billion and the possibility of another $3.8 billion from loans to the IMF from eight other industrial countries
2. Outstanding swap agreements with other central banks aggregating $1.6 billion
3. The possibility of other borrowings from foreign central banks and governments
4. The possibility of mobilizing private United States short-term claims against foreigners.

Thus, the United States has many types of monetary defenses, but all this is not to say that the United States will not be faced with demands for payment or that these demands can be met without difficulty. A na-

tion's capacity to pay depends not only on the size of its international reserves and borrowing facilities, but also on its flow of receipts relative to its flow of international payments. And the United States had deficits in its balance of payments in almost every year from 1950 through 1963. Where will it all end? You provide the answer.

CONCLUSIONS

The international monetary system has changed and continues to change rapidly. This is especially true of the various arrangements relating to international reserves and borrowing facilities. As we shall see later, many questions remain unanswered. Will the present type of system prove to be stable, or will it break down or behave erratically? Will it provide the necessary secular growth of international liquidity? Should it be replaced by, or at least supplemented by, an international central bank with power to manufacture claims that nations would agree to accept as international reserves and means of payments?

18. International Payments and Exchange Rates

This chapter will analyze in some detail a nation's international flows of receipts and payments. Its purposes are several: to describe the various types of international economic and financial transactions; to see how economic events in one country affect others, and how that country is in turn affected by economic events in the rest of the world; and to analyze the behavior of exchange rates. For these purposes, concepts and statistics relating to balances of payments are invaluable.

A NATION'S BALANCE OF PAYMENTS

The balance-of-payments concept has been officially defined as follows:

> The balance of payments of a country consists of the payments made, within a stated period of time, between the residents of that country and the residents of foreign countries. It may be defined in a statistical sense as an itemized account of transactions involving receipts from foreigners on the one hand, and payments to foreigners on the other. Since the former relate to the international income of a country, they are called "credits," and, since the latter relate to international outgo, they are called "debits."[1]

Several points concerning a nation's balance of payments deserve emphasis.

1. It is not a balance sheet showing the nation's international assets and liabilities at a point in time. Instead, it shows *for some stated period of time* the

[1] U.S. Department of Commerce, *The Balance of Payments of the United States*, Washington, D.C., U.S. Government Printing Office, 1937, p. 1.

flow of that nation's receipts from the rest of the world and of its payments to the rest of the world.
2. Following the conventional rules of double-entry accounting that any entity must account for the use of all its receipts and must show the sources of all its payments, a nation's payments and receipts for any period must be exactly equal. Thus, the payments side accounts for all the uses of the nation's receipts from the rest of the world, and the receipts side accounts for the sources of the funds used to make total payments to the rest of the world.
3. One nation's receipts are payments for the rest of the world, and its payments are receipts for the rest of the world.

International transactions are essentially the same as those domestically; they are all included in purchases and sales of goods and services, purchases and sales of claims, and unilateral transfers. However, to facilitate description and analysis, they are classified in a more detailed way in Table 18–1.

TABLE 18–1. Components of the United States Balance of Payments

Receipts (or *Credits*)	*Payments* (or *Debits*)
1. Exports of goods and services	1. Imports of goods and services
(a) Merchandise	(a) Merchandise
(b) Services	(b) Services
(c) Income on foreign investment	(c) Foreign income on investments in the United States
2. Sales of long-term claims	2. Purchases of long-term claims
(a) Equity claims	(a) Equity claims
(b) Debt claims	(b) Debt claims
3. Sales of short-term claims	3. Purchases of short-term claims
(a) Against deposits	(a) Against deposits
(b) Other	(b) Other
4. Sales of gold	4. Purchases of gold
5. Unilateral receipts	5. Unilateral payments
6. Errors and omissions	

Our exports of goods and services are obviously a source of receipts. They represent the part of our GNP for the stated period that is purchased by the rest of the world. They include not only exports of goods, but also many types of services such as shipping services, banking and other financial services, and services to foreign tourists in the United States. They also include income earned on American claims against other countries. On the other hand, our imports of goods and services are obviously payment items. They include payments for purchases of goods, many types of services, and income paid on foreign claims against this country.

Exports and imports are the only items in the balance of payments that enter into the income and product accounts of nations. We shall

later want to emphasize that our exports (to be designated by X) is that value of our output demanded by the rest of the world, and that our imports (to be designated by M) is that value of our income for a period that we use to demand output by the rest of the world. We shall also be especially interested in the value of $(X - M)$, which is often called *balance on goods and services*, or "balance on current account."

All other transactions recorded in the balance of payments involve exchanges of claims of some sort. Our sales of long-term claims to foreigners are a source of receipts. These may be either ownership claims or debt claims, and they may be claims against this country or claims against other countries. On the other hand, our purchases of long-term claims, whether equity or debt claims, is a payment item. The same applies to short-term claims. Sales of deposit claims against American or foreign banks as well as sales of other short-term claims are sources of receipts; foreigners must pay us for them. On the other hand, purchases of deposits from foreigners, or purchases of any other short-term claims, are payment items. Gold is best viewed as only a claim in international transactions. Sales of gold by us is a source of receipts; foreigners must pay for the gold. On the other hand, gold purchases are a payment item.

Unilateral transfers refer to gifts and grants. They are a source of receipts when the United States receives gifts and grants, and a payment item when our people or government make gifts or grants to the rest of the world. The final item, "errors and omissions," sometimes called *unrecorded transactions*, is simply an admission that errors in estimating values have occurred and that some transactions have escaped identification. It is a net payment or receipt item reflecting values in the balance of payments that cannot be identified. It is suspected of being composed largely of unrecorded movements of short-term claims.

As already noted, a nation's total receipts and total payments for any stated period must be exactly equal. This is true because we include in the balance of payments, as receipt or payment items, the net changes in the nation's gold stock and other international-reserve items. Since we want to isolate changes in the nation's international-reserve position in order to explain them, we shall rearrange some items in the balance of payments.

In general, a "surplus" in a nation's over-all balance of payments during some stated period means that its "net international-reserve position" has increased by that amount during the period. And a "deficit" in its over-all balance of payments means that its net international-reserve position has decreased by that amount during the stated period. The term *balance*, to be designated by B, is used to mean the net

change, whether positive, negative, or zero, in a nation's net international reserves during a stated period. Since nations measure their net international-reserve positions in different ways, their definitions of B also differ. However, under official definitions, the United States net reserve position is increased by an increase in its gold stock and by a decrease in its short-term liabilities to foreigners. And its net reserves are decreased by a decrease in its gold stock and by an increase in its short-term liabilities to foreigners. Thus, for any stated period,

$$B = \Delta G - \Delta D$$

where: ΔG = net change in the nation's gold stock during the stated period
ΔD = net change in U.S. short-term liabilities to foreigners during the stated period

The logic of this formula becomes clear as we remember that a surplus of receipts over payments on all other accounts enables us to increase our gold stock or decrease our short-term liabilities to foreigners. And an excess of payments over receipts on all other accounts must be covered by parting with gold or by increasing our short-term liabilities to foreigners.

Let us now see how the behavior of all the other categories of receipts and payments determine B. To simplify our analysis, we shall use symbols and deal with net receipts and net payments for some of the categories.

(1) X = value of exports of goods and services
(2) M = value of imports of goods and services
(3) $X - M$ = balance on goods and services
(4) U = net unilateral transfers to foreigners. This is equal to transfers made minus transfers received. Thus, it is a net payment item when positive and a net receipt item when negative.
(5) L = net purchases of long-term claims from foreigners. It is equal to purchases of long-term claims from foreigners minus their purchases of long-term claims from us.
(6) S = net purchases of short-term claims on foreigners. This is equal to the net change during the period in the stock of our short-term claims against foreigners.
(7) E = errors and omissions stated as a net payment item. Thus, it is a net payment item when positive and a net receipt item when negative. This will be ignored in most of our analysis.

Note that X and $(X - M)$ are the only items that are receipt items when they are positive. All the others are net-payment items when they are positive, but are net-receipt items when they are negative. Explain why this is true of U, L, and S.

Relations among the foregoing items may be stated in various forms of equations. One useful form is the following:

$$(1) \qquad B = (\Delta G - \Delta D) = X - (M + U + L + S + E)$$

In other words, the over-all balance is equal to total receipts for exports minus payments for imports, net transfer payments, net purchases of long- and short-term claims, and net payments in unrecorded transactions. To illustrate this, let us insert figures from the United States balance of payments for 1961, as shown in Table 18–2.

$$\begin{array}{rl} \Delta G = & -\ 742 \\ \Delta D = & \ \ 1719 \\ \hline (\Delta G - \Delta D) = & -\ 2461 = \overset{X}{28{,}066} - \left(\overset{M}{22{,}923} + \overset{U}{3655} + \overset{L}{1875} + \overset{S}{1472} + \overset{E}{602} \right) \end{array}$$

TABLE 18–2. United States Balance of Payments
(amounts in millions of dollars)

Receipt and Payment Items	1960	1961	1962
Exports of goods and services (X)	\$27,013	\$28,066	\$29,814
Imports of goods and services (M)	23,188	22,923	24,999
Balance on goods and services account ($X - M$)	3,825	5,143	4,815
Net unilateral payments (U)	3,611	3,655	3,077
Net purchases of long-term claims (L)	2,209	1,875	2,338
Purchases of short-term claims on foreigners (S)	1,338	1,472	581
Errors and omissions (as debits) (E)	592	602	1,000
Sum of $U + L + S + E$	7,750	7,604	6,996
$B = (X - M) - (U + L + S + E)$	−3,925	−2,461	−2,181
Composition of $B = \Delta G - \Delta D$:			
$\Delta G =$	−1,702	− 742	− 907
$\Delta D =$	+2,223	+1,719	+1,274
$B =$	−3,925	−2,461	−2,181

SOURCES: *Economic Report of the President*, January, 1963, pp. 262–268. *Survey of Current Business*, March, 1963, pp. 19–20.

In 1961, the United States had an over-all deficit, or negative B, of \$2461 billion. This resulted from payments of \$30,527 million in form of M,U,L,S, and E while receipts from exports were only \$28,066 million. Foreigners accepted payment for the balance by taking \$742 million of our gold and by increasing their short-term claims against us by \$1719 million. Of course they could have elected to take more gold and less short-term claims, or vice versa.

Writing the equation in a slightly different way enables us to con-

centrate attention on the balance on goods and services, or the balance on current account:

$$(2) \qquad B = (X - M) - (U + L + S + E)$$

In 1961, we had a \$5143 million balance on goods and services account. This may be looked upon as our net earnings from international trade in goods and services. It measures the amount we could have spent abroad for net unilateral transfer payments and net purchases of long- and short-term claims without any change in our net international-reserve position. In fact, we spent \$7604 million for these purposes, thereby incurring an over-all deficit of \$2461 million. However, B depends not on the size of one item alone, but on all.

These few examples illustrate the usefulness of balances of payments in analyzing not only B but also many other relationships. It should be clear, however, that a balance-of-payments statement does not provide a theoretical explanation of the behavior of the various components. As do other statements we have used, it merely uses ex post accounting to record what did, in fact, happen. Nevertheless, it is useful in forcing us to identify and to define clearly the various components, and to recognize certain relationships of the totals. A close scrutiny of the various components also suggests the nature of some of the ways in which the economies of different countries are interrelated, and shows some of the items requiring analysis:

1. Since a nation's exports of goods and services represent the part of its output demanded by the rest of the world, changes in this demand can alter the total demand for its output.
2. Large international payments are made to purchase long- and short-term securities. These are often called *capital flows*. Since most of these are profit-motivated, it is reasonable to believe that they are affected by relative levels of interest rates in various countries. Thus, a restrictive monetary policy in one country as a means of raising interest rates will tend to attract funds from other countries and to raise interest rates in those countries, with consequences not only for their balances of payments and money-market conditions but also for their levels of output.
3. These various flows affect the size of a nation's gold stock and other international reserves, thereby tending to affect its money supply.
4. All these things are interrelated.

We shall now analyze the behavior and the interrelationships of the most important of these items. It is essential to remember that we are interested in two related types of things: (1) The behavior of income, price levels, and interest rates in the various countries, and relations among the countries on income and product account; and (2) the

determination of exchange rate behavior. For this purpose we shall use supply functions and demand functions for moneys in exchange markets, and shifts of these functions.

EXPORTS, IMPORTS, AND INCOME LEVELS

The composition and size of any nation's exports and imports obviously depend on many conditions, not only those at home but also those in other countries with which it trades or could trade. Among these are all the conditions that determine comparative advantages in the production of various products: relative endowments of the various types of natural resources, of various types of human labor, and of capital; relative states of technology; and so on. Also highly relevant are the preference patterns of people in that nation and in other nations for the products of the different countries—the tastes and preferences that help determine demand functions. In a full-scale study of international economics, these things would be analyzed in detail. However, since we are interested primarily in the monetary aspects of international economic relationships, we shall assume that these other conditions are given and constant. This enables us to concentrate on two forces that are clearly relevant to the behavior of exports and imports: the level of national incomes and the price level in each country relative to price levels abroad. Each nation's demand for imports is affected by the level of its income, and both its demand for imports and its ability to export are affected by the level of its prices relative to those abroad. We shall first explore relations between income levels and levels of imports and exports.

For this purpose it will be convenient to reclassify some of the items in our earlier statements of national output and income. When we were highlighting domestic aspects, we expressed the value of a nation's output, or total expenditures for its output, as $Y = C + I + G$. It will be remembered that I included gross private domestic investment plus $(X - M)$. Also, consumption, gross private domestic investment, and government purchases included an import component. Now we break down these values. C_d, I_d, and G_d will now include only domestic expenditures in these forms for domestic output. X represents expenditures for the nation's output by the rest of the world. Thus, in terms of the total value of a nation's output or total expenditures for its output,

$$(1) \qquad Y = C_d + I_d + G_d + X$$

This formulation makes it clear that changes in foreign expenditures for X can raise or lower the demand for a nation's output.

At an earlier stage, we expressed the disposal of a nation's disposable income as $Y = C + G + S$, including in C and G an import component. Now we break this down and include imports (M) as a way of using national income. Thus,

$$Y = C_d + G_d + S + M \tag{2}$$

A nation uses some of its disposable income to buy domestic output for consumption and government use, some to buy imports, and the remainder for saving. Like saving, imports are a "leakage" from the income stream of an individual country, for they are a part of the value of its output and income that is not returned to the market as a demand for domestic output.

Other things equal, a nation's demand for imports is a positive function of its income. It will use some part of each increase of its income to buy more imports. Some of these will be in finished form, such as perfume, foreign cars, Paris hats, or machine tools. Some will be in the form of imported raw materials or components needed for production, such as iron ore, wool, petroleum, or tin. On the other hand, a nation typically decreases its expenditures for imports when its national income falls. We shall use $\Delta M/\Delta Y$ to denote "the marginal responsiveness of imports to income." The size of $\Delta M/\Delta Y$ is likely to be relatively large for countries heavily involved in foreign trade. For example, it may be 25 percent or even higher for such countries as Denmark, the United Kingdom, or Belgium. However, for more self-sufficient countries like the United States, it is likely to be smaller.

We must also modify our statement of the multiplier. If saving is the only "leakage," the multiplier is $1/(\Delta S/\Delta Y)$. But as soon as $\Delta M/\Delta Y$ is greater than zero, the multiplier becomes $\dfrac{1}{(\Delta s/\Delta y) + (\Delta m/\Delta y)}$. Thus, $\Delta M/\Delta Y$ tends to decrease the size of the multiplier. For example, if $\Delta S/\Delta Y = 0.4$ and $\Delta M/\Delta Y = 0$, the multiplier is $1/0.4 = 2.5$. But if $\Delta M/\Delta Y = 0.1$, the multiplier is $1/(0.4 + 0.1) = 2.0$. We shall use this very simple form of multiplier, although it does not take into account any "backwash" effects on demand for the nation's exports resulting from induced changes of income levels abroad. This will be accounted for in other ways.

Increase in Domestic Incomes

Let us first consider the case in which country A's output and income are increased by an upward shift of C_d, I_d, or G_d demands, which do not involve any shifts of export or import functions. Such increases could

reflect upward shifts of the consumption function, or the investment-demand function, or the adoption of expansionary fiscal or monetary policies. Let us assume that the autonomous change is a \$10 billion increase of the I_d demand. This, of course, tends to induce increases in consumer demands in the familiar multiplier fashion. Now, however, we must recognize that some fraction $(\Delta M/\Delta Y)$ of each increase of income will be used to increase imports, and is thus a leakage from the nation's income stream. The multiplier effects can be expressed as

$$\Delta Y = \Delta I_d \frac{1}{(\Delta S/\Delta Y) + (\Delta M/\Delta Y)}$$

Assuming that $\Delta I_d = \$10$ billion, $\Delta S/\Delta Y = 0.4$, and $\Delta M/\Delta Y = 0.1$, we find that

$$\Delta Y = \$10 \text{ billion } \frac{1}{0.4 + 0.1} = \$20 \text{ billion}$$

With this rise of Y, the nation's imports (ΔM) will tend to increase by an amount equal to $\Delta Y(\Delta M/\Delta Y)$. With $\Delta Y = \$20$ billion and $\Delta M/\Delta Y = 0.1$, $\Delta M = \$20 \text{ billion} \times 0.1 = \$2$ billion. The rise of country A's domestic income levels has served to worsen its balance of payments position.

This example of an autonomous change in the level of one nation's income brings out several important points:

1. To the extent that a nation's imports are responsive to its income level, domestic multiplier effects will be smaller.
2. Changes in the level of a nation's income affect its balance-of-payments position by changing, in the same direction, its payments for imports. We shall emphasize when we later consider exchange-rate theory that the higher a nation's level of income, the more of its money is it likely to supply in exchange markets to pay for imports.
3. Since one nation's imports are exports for the rest of the world, changes in the income level of one country tend to be transmitted to other countries through changes in its demand for their exports. Thus, a rise of incomes in country A, which increases its demand for the exports of others, can initiate increases of income abroad.

The simple multiplier analysis used above brings out several important points. However, it should not be assumed that the effects will be exactly those indicated by this analysis. For one thing, the analysis ignores "backwash" or "feedback" effects from induced changes of income levels abroad. For example, the increase of country A's demand for the exports

of others tends to raise, both directly and through multiplier effects, the level of their output and income. Some parts of these increases in foreign income are likely to be used to increase demands for the exports of country A. The size of these feedback effects is important for two reasons: (1) to the extent that they occur, they offset the increase of imports by country A, reduce its net leakages on foreign trade account, and make larger its domestic multiplier effects: and (2) they also reduce the extent of the worsening of country A's balance of payments; some part of the increase of A's imports will be offset by the induced rise of foreign demands for its exports.

The multiplier also ignores effects on the money supplies of country A and of the rest of the world. The rise of country A's imports tends to reduce the size of B, its over-all balance, and perhaps to make it negative or more negative. Suppose that country A makes net payments by selling gold to the rest of the world. This, as we found earlier, tends to reduce bank reserves in country A, to restrict credit, and to raise interest rates. To the extent that this occurs, it will tend to restrict demands for domestic output in A and to "snub" the upward multiplier effects. In the rest of the world, which receives the gold, the effects are in the opposite direction. However, it should be remembered that the monetary authorities in country A or the rest of the world, or both, may elect to offset the domestic effects of these gold flows.

Further, the multiplier ignores the behavior of interest rates. Interest rates in country A tend to be increased for two reasons: (1) because of the rise of its income level, and (2) because of any restriction of its money supply that is allowed to occur. In the rest of the world the receipt of gold and any monetary expansion that is permitted to occur tend to lower interest rates, but any rise of income induced by the increase of country A's demand for its exports tends to raise interest rates. As already noted, the rise of interest rates in A tends to snub the rise of its income level. And a rise of interest rates in A relative to those abroad tends to attract inflows of funds to purchase its securities, or at least to decrease outflows of funds. This, of course, tends to help A's balance of payments.

Finally, the multiplier ignores effects on price levels. Up to this point, the analysis has assumed price levels to remain constant, so that changes in income were changes in real income. This may be realistic if output is still below full-employment levels even after the increases of demand. But suppose that price levels in A are increased relative to those in the rest of the world. This will tend to decrease A's exports and also to in-

crease its imports as the people of A are induced to substitute imports for higher priced domestic products.

In summary, autonomous increases in a country's income level do indeed have powerful international effects. To the extent that they induce increases in the country's demand for the exports of the rest of the world, they serve to spread the rise of incomes. They also worsen the country's balance-of-payments position. But the "real income effects" tell only a part of the story. Also relevant are changes in the money supplies of the various countries, changes in price levels, and changes in interest rates.

Decrease in Domestic Incomes

An autonomous decrease in the level of a nation's income tends to have international effects that are just the reverse of those described above: to decrease its demands for the exports of other countries, to decrease its payments to them, and to decrease the quantities of its money offered in foreign-exchange markets. Here again, the full story includes effects on money supplies, price levels, and interest rates.

Changes in Demand for a Nation's Exports

We have now seen how changes in the level of a nation's income emanating from internal sources can spread to other countries and affect balances of payments. Let us now see how a nation's income level and balance-of-payments position can be affected by changes in foreign demands for its exports. Suppose that the initial change is a \$5-billion increase in foreign demands for its exports. This has two important direct effects: (1) It directly increases total demand for the nation's output and induces upward multiplier effects, and (2) It increases the nation's receipts for exports and improves its balance-of-payments position. This may tend to increase the nation's money supply and to decrease money supplies abroad.

However, the story is not yet ended. As the nation's income rises because of both the initial increase of demand for its exports and the induced multiplier effects, its demands for imports will rise. This tends both to raise incomes abroad and to increase the supply of the nation's money in exchange markets. Thus, we find that the initial change of demand for the nation's exports, which improved its balance of payments, tends to lessen the size of its favorable balance by increasing the nation's demand for imports.

Changes in money supplies may also play a role in the readjustment process. Suppose that the initial increase in the country's receipts for ex-

ports is received in gold, and that this is allowed to increase bank reserves, to expand the money supply, and to lower interest rates. Suppose also that gold-losing countries contract credit and raise interest rates. The fall of interest rates in the gold-receiving country has two types of effects:

1. It serves to stimulate domestic investment and to raise further the level of the nation's income. This, in turn, stimulates further increases in its imports and payments to other countries. Thus, an expansion of the money supply in the gold-gaining country makes more powerful the forces tending to eliminate the country's initial excess of receipts over payments. Monetary contraction in the gold-losing countries also serves this purpose by lowering their incomes and reducing their demand for imports.
2. The fall of interest rates in the gold-gaining country, together with any rise of interest rates in the gold-losing countries, tend to induce capital outflows from the gold-gaining country, or at least to inhibit inflows. This, too, tends to offset the initial excess of receipts over payments.

Of course the monetary authorities of the gold-gaining country, of the gold-losing countries, or both, may prevent changes in their balances of payments from affecting bank reserves, money supplies, and credit conditions. However, to the extent that they do prevent such changes, they reduce the power of the forces that serve to bring international receipts and payments back into equilibrium. The outcome also depends somewhat on the behavior of price levels. Suppose that prices in the gold-gaining country are increased by the initial increase of demand for its exports, the induced upward multiplier effects, and the expansion of its money supply, while prices abroad remain constant or fall. This rise of its prices relative to those abroad will tend to reduce its exports and to increase its imports, both of which serve to reduce the excess of its international receipts over its payments.

Summary

These are but a few examples of the interrelationships of national economies through transactions on income and product account. However, they do indicate how changes in income levels originating in one country or group of countries can spread to others, how the income level of a country can be altered by changes in foreign demands for its output, and how all of these things affect the flow of international payments and the behavior of each nation's international reserve.

INTERNATIONAL CAPITAL FLOWS

The various national economies are interconnected not only through transactions on income and product account, but also through transactions involving the purchase and sale of long-term ownership and debt claims and short-term claims. These international capital flows are of interest for two reasons: because of their effects on balances of payments, and because of their effects on the supply of investable funds, interest rates, and income levels in the various countries. For example, suppose country A receives large inflows of funds to purchase long-term securities or short-term claims. This is obviously a receipt item in its balance of payments. It also adds to the supply of investable funds in the country and tends to lower interest rates, thereby affecting the nation's income level. On the other hand, outflows of such funds from a country are payment items in its balance of payments, which tend to decrease its supply of investable funds and to raise interest rates.

In our exchange-rate theory, we shall assume that, other things equal, the direction and magnitude of international flows of capital depend on the relative heights of interest rates in the various financial centers. This is especially true of short-term funds. These flows are rarely so sensitive to interest-rate differentials as to bring rates into equality in all countries. Yet there is a considerable marginal responsiveness of these flows to changes in interest differentials. Central banks often change these differentials deliberately as one way of regulating balance-of-payments positions. For example, a central bank raises its discount rate, restricts credit, and raises domestic levels of interest rates in order to attract an inflow of funds, or at least to lessen outflows.

This responsiveness of international capital flows to interest-rate differentials can be embarrassing to central banks in their pursuit of domestic objectives. Suppose, for example, that one country or group of countries is restricting credit and raising interest rates in order to combat inflationary pressures at home, while another country or group of countries is following an expansionary monetary policy and lowering interest rates in an effort to raise domestic levels of output and employment. Large flows of funds to the countries that are trying to restrict credit add to their supplies of investable funds and lessen the degree of restriction. And the country trying to increase domestic supplies of credit may experience a worsening of its balance-of-payments position without achieving the desired amount of credit ease at home. This can be especially embarrassing if the nation is already in weak balance-of-pay-

ments and international-reserve positions. Several instances of this sort occurred in the early 1960s.

Speculative flows in anticipation of changes in exchange rates can also be embarrassing. Suppose that, for some reason, good or bad, many come to anticipate that the exchange rate on the dollar may decline significantly at some time in the near future. Foreign holders of dollars may rush to sell them before the anticipated depreciation, using the proceeds to buy claims against other moneys. Some may borrow dollars and sell them, hoping to profit by repaying them later with dollars purchased at a lower price. Americans may also rush to buy foreign claims. Such large outflows can induce gold losses, restrict money at home, and even force the country to reduce the exchange rate on the dollar. One of the purposes of central-bank cooperation and of various international borrowing arrangements is to guard against this type of flow.

We shall now proceed to use much of the preceding materials to develop an analysis of exchange-rate determination. As a first step, we shall look at the nature and functions of exchange rates, at the structure of exchange rates at any given time on various types of claims on a particular national money, and at the relative levels of exchange rates in geographically separated markets.

EXCHANGE RATES

Whenever things are exchanged against each other, there must, of course, be some rate or ratio of exchange between them; there must be some sort of "price." By the "exchange rate" between two monetary units we mean simply the number of units of one money required to buy one unit of the other. Either monetary unit may be employed as the unit for stating the price of the other. For example, a situation in which two Philippine pesos exchange for one United States dollar could be stated either as \$1.00 = 2 Philippine pesos or as 1 Philippine peso = ½ dollar. Also, a change in the exchange rate of \$1.00 = 3 Philippine pesos can be expressed either as a rise in the exchange rate on the dollar relative to the peso or as a decrease in the exchange rate on the peso relative to the dollar.

Structure of Exchange Rates in a Given Market at a Given Time

In our later discussion, we shall find it convenient to speak of "the" exchange rate between two national moneys in a given market at a given

time. In fact, however, there is not a single rate but a cluster of rates between the two moneys, though all fall within a narrow range. These differentials are of three main types.

1. Differences Between Dealer's Buying and Selling Prices. For example, a dealer may pay you only $2800 for a £1000 draft on a London bank at the same time that it would charge you $2804 for such a draft. It is out of this margin between selling and buying prices that exchange dealers pay their expenses and make profits.

2. Differences in Maturities of the Claims. At some given time, the array of rates on sterling in the New York market might be as follows:

Cable rate	$2.80 ⅛
Sight rate (banker's demand drafts)	2.80
Rate for 60-day banker's bills	2.79 $\frac{5}{16}$

Thus, at any time, the cable rate is highest, followed by the rate on sight or demand drafts and then by the rate on time bills. This is because of differences in the time that sterling is paid out abroad. If a cable order is used, the selling bank loses that amount of its sterling balance almost immediately. If the bank sells a sterling demand draft, it does not lose its sterling balance until a few days later when the draft has traveled to London and has been presented for payment. In effect, the bank has the use of the funds during the intervening period. Lowest of all is the exchange rate on time drafts or bills, for these are not payable until a future date. The rate on a sterling time draft is equal to the rate on sterling demand drafts less interest to the maturity of the time bill.

3. Differences in the Degree of Safety and Liquidity of the Claims. A claim on a well known and highly regarded foreign bank will bring a higher price than a claim on a less highly regarded bank or on a non-bank debtor in whom confidence is not so high.

When we refer to "the" exchange rate between two moneys we shall, unless otherwise specified, mean the rate applicable to sight or demand drafts on highly regarded banks. It will be assumed that the prices of other claims cluster around this rate in their appropriate competitive positions.

Exchange Arbitrage

Competition tends to establish one rate of exchange between two moneys in a given market at a given time. For example, the dollar price of sterling cables tends to be the same at all New York banks at a given

moment. But may not exchange rates between two moneys be quite different in two widely separated markets, such as New York and London? This is impossible if movements between the markets are unrestricted, largely because of the possibility of arbitrage. By arbitrage we mean the simultaneous purchase of something in a cheap market and its sale in a dear market to profit from price differences between the markets. Arbitrage must not be confused with speculation, whose purpose is to profit from price differences between different points in time.

Exchange arbitrage is carried out through cable orders. Let us consider first what is usually called *two-point arbitrage*. Suppose that the cable rate in New York is £1 = \$2.81 at the same time that it is £1 = \$2.80 in London. An arbitrageur—who may be the foreign-exchange department of a big New York bank—could make abnormally large profits out of this discrepancy. He could sell a £100,000 cable in New York for \$281,000 and at the same time order his London correspondent to draw a \$280,000 cable order on New York and sell it for £10,000. Thus, in a matter of minutes, the arbitrageur would make a gross profit of \$1000; he would sell in New York for \$281,000 the sterling for which he paid in London only \$280,000. The effect of these transactions is to equalize exchange rates in New York and London. The sale of sterling in New York tends to lower its dollar price there, and the offer of dollars for sterling in London tends to raise the dollar price of sterling in that market. Exchange rates must be practically the same in the two markets after arbitrageurs have completed their operations. In fact, discrepancies as large as the one assumed in our example could hardly occur in a market free of restrictions, for exchange arbitrageurs are always on the alert and can make good profits from very small margins. For this reason, we can, with little inaccuracy, speak of one exchange rate between two moneys at a given time without specifying the market to which we are referring. This obviously is not possible if movements of funds between the markets are restricted.

The foregoing example referred to two-point arbitrage, in which arbitrageurs dealt in only two moneys and two markets at once. But they can also deal in three or more markets simultaneously, thereby helping to establish at any given point in time a consistent network of exchange rates. For example, someone in the United States may purchase pounds directly with dollars, or he may first purchase some other money with dollars and then use that money to buy pounds. In unrestricted markets, arbitrageurs act in such a way as to make the cost of each money approximately the same whether it is purchased directly or through a series of exchange operations involving more than two moneys. To il-

lustrate the principles of three-point arbitrage, let us assume that the following exchange rates exist at some point in time:

£1 = $2.81
1 Belgian franc = 1.9 cents
£1 = 139 Belgian francs

An arbitrageur could make abnormal profits from this situation by doing simultaneously something like the following:

1. Sell £100,000 for $281,000
2. Pay $264,100 for 13,900,000 Belgian francs at 1.9 cents each
3. Use the 13,900,000 Belgian francs to buy £100,000 to cover his sales of sterling for dollars

In this way, he would make a gross profit of $16,900 because he sold for $281,000 the sterling that he acquired for only $264,100 by the circuitous process of buying Belgian francs with dollars and using the francs to buy pounds. But his operations tend to erase the profitability of further operations of this type. His sale of sterling for dollars tends to lower the dollar price of sterling; his purchase of francs with dollars tends to raise the dollar price of the franc; and his purchase of pounds with francs tends to raise the price of the pound in terms of francs. Arbitrage transactions of this sort would not cease until each currency cost almost exactly the same whether purchased directly or through transactions in other moneys. The following exchange rates are consistent with each other:

£1 = $2.80
1 Belgian franc = 2 cents
£1 = 140 Belgian francs

In a system of unrestricted exchange markets, arbitrage operations of these types maintain mutually consistent relationships among the exchange rates of all moneys in all markets at any given time.

Exchange Rates as Price Converters

Exchange rates are not merely prices at which national moneys are exchanged for each other. They are also converters or translators of prices stated in one money into prices stated in another money. They therefore play an important role in international trade in goods and services. For example, suppose the British price of some commodity is £1. To United States buyers and sellers, who base their decisions on

prices stated in dollars, this sterling price is meaningless until they know the dollar price of a pound. The translation is as follows:

$$\text{Dollar price of the commodity} = \text{sterling price of the commodity} \times \text{dollar price of the pound}$$

Case I:	\$1.00 =	£1	×	£1 = \$1.00
Case II:	\$2.00 =	£1	×	£1 = \$2.00
Case III:	\$3.00 =	£1	×	£1 = \$3.00

Suppose the price of the commodity remains at £1. At an exchange rate of £1 = \$1.00, a very low exchange rate on the pound in terms of dollars or a very high exchange rate on the dollar in terms of pounds, the price to Americans will be \$1.00. At an exchange rate of £1 = \$2.00, a higher exchange rate on the pound in terms of dollars or a lower exchange rate on the dollar in terms of pounds, the price to Americans will be \$2.00. Thus, with any given level of prices in Britain, the higher the exchange rate on the pound in terms of dollars, the more costly will be British exports in terms of dollars. And to the extent that American demands for imports are elastic to price, the smaller will be British exports to the United States. By depreciating the pound in terms of dollars, the British can lower the dollar price of its exports and sell a larger quantity.

It is useful to note that changes in the exchange rate on the pound shift the demand function for British exports as stated in pounds and as seen by British exporters. Suppose that, at some time, incomes, price levels, and other conditions are such that the American demand for British exports, stated as a function of their price in dollars, is that shown in Part A of Fig. 18–1. This assumes that it is the price in dollars that affects quantities purchased by Americans. Part B shows this demand function translated into demand functions in terms of prices in sterling at different exchange rates. If the exchange rate is £1 = \$1.00, the demand for British exports as a function of their prices in pounds is exactly the same as the demand as a function of their prices in dollars. For example, if Americans would buy some quantity Q_1 of British exports at a dollar price of P_1, they will buy the same quantity at a pound price of P_1. This is illustrated by D_1D_1. But what if the exchange rate is £1 = \$2.00, so that each pound costs twice as many dollars? Americans will now buy any given quantity of British exports only at a pound price just half as high. This is illustrated in Part B of Fig. 18–1 by the downward shift from D_1D_1 to D_2D_2. At each quantity, the price on the D_2D_2 curve is only half that on the D_1D_1 curve. Thus, the higher the exchange rate

on the pound, other things equal, the lower is the sterling price at which Britain can sell any given quantity of exports, and the smaller is the quantity of exports it can sell at any given price in terms of sterling. And, of course, the lower the exchange rate on the pound, the higher will be the sterling price at which Britain can sell any given quantity of exports and the higher will be the quantity of exports it can sell at any given price in terms of sterling.

Reduction of the exchange rate on its money is an interesting device that a nation can use to cheapen its exports to foreigners without reducing their prices in terms of domestic currency received by its exporters.

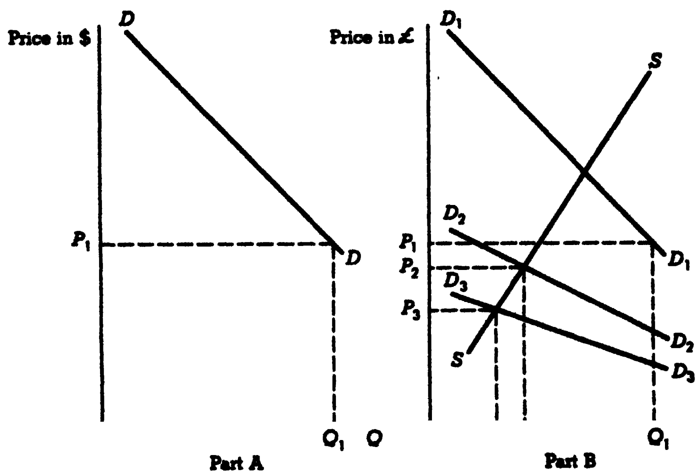

FIG. 18–1. Shifts of Export-Demand Functions by Changes in Exchange Rates.

This device can even succeed simultaneously in cheapening exports to foreign buyers and in raising the prices received by its exporters. Suppose, for example, that the British supply function of exports is represented by *SS* in Part B of Fig. 18–1 and that Britain lowers the exchange rate on the pound from £1 = $3.00 to £1 = $2.00. This shifts upward the demand function for British exports from D_3D_3 to D_2D_2. The devaluation of the pound both decreases the dollar price of British exports—thus increasing their quantity—and raises export prices in terms of sterling from P_3 to P_2.

We conclude that, if other things remain equal and if foreign demands are at all elastic to price, reduction of the exchange rate on a nation's money will (1) increase the physical quantity of its exports, and (2) in-

crease the total value of its exports as measured in terms of its own money. We shall later make much use of the proposition that the lower the exchange rate on a nation's money, the greater will be the quantity of its money demanded in exchange markets to buy its exports.

How will a reduction of its exchange rate affect the total value of a nation's exports in terms of foreign moneys—its total export proceeds in foreign moneys? This depends on the elasticity of foreign demands for its exports. For example, a reduction in the dollar price of British exports affects Britain's total dollar proceeds from exports in two ways. The reduced dollar price per unit tends to reduce total dollar proceeds, but increases in quantities exported serve to increase them. Total export earnings in dollars will increase only if quantities exported rise more than enough to offset the decreased dollar price per unit; that is, if the price elasticity of demand is greater than unity.

British importers will also use exchange rates to convert foreign prices into prices in terms of pounds. Suppose that the price of some American commodity is \$1.00. This can be translated into prices in pounds as follows:

	Pound price of commodity	=	dollar price of commodity	×	pound price of dollar
Case I:	£1	=	\$1.00	×	£1
Case II:	£½	=	\$1.00	×	£½
Case III:	£⅓	=	\$1.00	×	£⅓

Suppose the exchange rate is £1 = \$3.00, or \$1.00 = £⅓. At this high exchange rate on the pound or low exchange rate on the dollar, the import price of the commodity would be £⅓ and the British might buy much of it. But at the lower exchange rate on the pound of \$1.00 = \$2.00, or \$1.00 = £½, the import would be more expensive and less of it would be bought.

Our later analysis will make much use of this proposition: Other things equal, the higher the exchange rate on a nation's money, the less expensive will be its imports and therefore the greater the quantity of its imports. And the lower the exchange rate on its money, which the nation will view as higher exchange rates on foreign moneys; the more expensive will be its imports and the smaller their quantity. It will demand smaller amounts of foreign moneys in exchange markets to pay for its imports, and it will offer smaller quantities of its own money in exchange markets to pay for imports if the price elasticity of its demand for imports is greater than unity. The reader is invited to show how a reduction of the exchange rate on sterling (a rise of exchange rates on for-

eign moneys) appears to foreign exporters as a downward shift of the British demand function for their exports.

In order to isolate the effects of exchange rates on exports and imports, we assumed that price levels in the various countries were given and constant. However, it is obvious that changes in price levels and in relative price levels also affect imports and exports. For example, a rise of British prices relative to those abroad makes British export prices higher at each level of exchange rates and tends to discourage her exports. Also, by making prices of domestic products higher relative to prices of imports, it tends to increase her imports. We shall make much use of this proposition: The higher the level of prices within a country relative to those abroad, the smaller will be the value of its exports at each level of exchange rates and the larger will be its imports.

Determination of Exchange Rates

Let us now see how exchange rates are determined in the absence of restrictions on exchange dealings. We shall start with the case in which official agencies do not peg exchange rates or otherwise intervene, but allow rates to be determined by free-market forces. To illustrate the principles involved, we shall analyze the dollar price of the pound sterling.

Since an exchange rate is a price, we should be able to use an ordinary supply-and-demand analysis. By the supply of sterling we shall mean a function or schedule showing the quantities of sterling that would be supplied in exchange markets per period of time at each of the various possible dollar prices of sterling. The components of the supply of sterling are, of course, the payments items in the British balance of international payments. The purpose of such a schedule or function is the usual one of isolating the effect of price (in this case the exchange rate) on the quantities supplied. But to draw such a curve, we must assume all other conditions affecting supply to be given and constant. Changes in these things can shift the supply function; that is, they can increase or decrease the quantity of sterling supplied at each exchange rate. Some principal determinants of the supply schedule of sterling are:

1. The level of real income in Britain
2. The level of prices and costs in Britain relative to those of other countries
3. Levels of interest rates in Britain relative to those of other countries
4. Expectations as to future exchange rates on sterling
5. Tastes for British products relative to those of other countries

6. Other factors relevant to the productivity and comparative costs of British and foreign producers

The supply schedule of sterling is indicated by the *SS* curve in Fig. 18–2. It is drawn on the assumption that the British demand for imports is price-elastic. It slopes upward to the right because a higher exchange rate on sterling tends to lower the sterling price of imports, and thus to stimulate British imports, whereas a lower exchange rate on sterling tends to raise the sterling price of imports, and thus to discourage British imports.

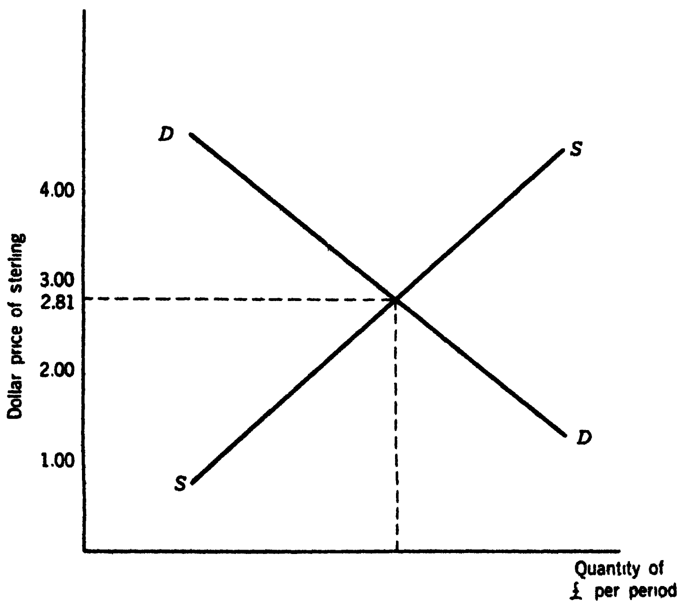

FIG. 18–2. Demand for, and Supply of, Sterling.

By the "demand for sterling" we mean a schedule, curve, or function showing the quantities of sterling that would be demanded at each of the various possible dollar prices of sterling. The components of this demand are the receipts items in the British balance of payments; that is, quantities of sterling demanded to pay for British exports and to purchase long- and short-term claims from the British. Again, our purpose in drawing such a curve is to isolate the effect of changes in the exchange rate on the quantities of sterling demanded. To do so, we must assume other conditions affecting the demand for sterling to be given and con-

stant. Shifts of these things can shift the demand curve for sterling. Some principal determinants of the demand schedule for sterling include:

1. The level of real income in the rest of the world
2. The levels of prices and costs in Britain relative to those of other countries
3. Levels of interest rates in Britain relative to those of other countries
4. Expectations as to future exchange rates on sterling
5. Tastes for British products relative to those of other countries
6. Other factors relevant to the productivity and comparative costs of British and foreign producers

That is, they can increase or decrease the quantity of sterling demanded at each level of exchange rates.

The demand schedule for sterling is indicated by the *DD* curve in Fig. 18–2. It slopes downward to the right because a lower rate on sterling stimulates the demand for British exports, whereas a higher sterling rate discourages the demand for British exports.

The exchange rate can be in equilibrium only when the quantity of sterling demanded is exactly equal to the quantity supplied, leaving neither an excess demand nor an excess supply. Figure 18–2 shows that, with the given *DD* and *SS* curves, this can occur only at the exchange rate £1 = $2.81. At any higher rate, the supply of sterling would exceed the demand for it; the quantity of sterling demanded would be smaller because British exports would be more expensive to foreigners. The quantity of sterling supplied would be larger because British imports would be cheaper in terms of sterling. On the other hand, at any lower exchange rate, the demand for sterling would exceed this supply of it. The quantity of sterling demanded would be larger because British exports would be cheaper to foreign buyers. The quantity of sterling supplied would be smaller because British imports would be more expensive in terms of sterling.

In short, as long as the *SS* and *DD* functions remain constant, the equilibrium exchange rate between the dollar and the pound will remain at $2.81. But the equilibrium rate can be shifted by anything that shifts the *SS* function or the *DD* function, or both.

Changes of Exchange Rates

Let us now consider a few of the more important developments that can shift the supply-and-demand functions for sterling, thereby changing the exchange rate. We shall pay special attention to changes in income levels, price levels, and interest rates.

1. Change in Level of British Prices and Costs Relative to Levels Abroad. Suppose, for example, that Britain experiences a domestic inflation of

her price and cost levels. As the sterling prices of British products rise, the demand curve for sterling will shift leftward and downward. British goods will now be more expensive at each level of exchange rates and British exports will be discouraged. The rise of British price levels will also shift the supply curve of sterling downward and to the right. As the prices of competing domestic products rise, the British will demand more imports at each exchange rate on the dollar.

Thus, we find that a rise of prices in Britain while prices elsewhere remain constant or rise less will tend to lower the exchange rate on sterling, both by shifting the demand function for sterling downward and to the left and by shifting the supply function of sterling downward and to the right. When a country inflates its domestic price levels significantly while prices elsewhere remain relatively constant, it usually cannot balance its receipts and payments without reducing its exchange rate to maintain its exports and discourage imports.

It should be noted that the same result may occur if British prices remain constant while prices elsewhere fall. The decline of prices elsewhere will make British exports relatively expensive to foreign buyers unless the exchange rate on the pound is reduced sufficiently. Also, British imports will be cheaper in terms of sterling unless the fall of prices abroad is offset by a fall of the sterling exchange rate and a rise of exchange rates on foreign moneys. Note that Britain may be able to prevent her domestic price level from falling with price levels abroad if she reduces sufficiently the exchange rate on sterling. A fall of British price levels relative to levels abroad would tend to raise the rate on sterling, both by increasing the demand for sterling at each exchange rate and by decreasing the supply of sterling at each exchange rate.

2. Changes in Level of Real Income in Britain. A rise of real income in Britain would tend to increase British imports at each level of exchange rates and thereby to increase the supply of sterling in exchange markets. It would therefore tend to lower the sterling exchange rate if the demand schedule for sterling remained constant. On the other hand, a fall of real income in Britain would tend to decrease the British demand for imports at each exchange rate, to decrease the supply of sterling at each exchange rate, and to raise the sterling rate in exchange markets.

3. Changes in Level of Real Income in the Rest of World. An increase of real incomes in the rest of the world tends to raise the demand for British exports at each exchange rate, to increase the demand for sterling at each exchange rate, and to raise the rate on sterling. Note that, to the extent that the rise of foreign demands for British exports is allowed to raise the exchange rate on sterling, Britain may be enabled to escape

inflationary effects on her domestic price level. On the other hand, a decline of real incomes abroad tends to decrease the demand for British exports at each exchange rate, to lower the demand for sterling at each rate, and to reduce the exchange rate on sterling. By allowing the sterling exchange rate to fall, thereby making British exports cheaper in foreign moneys, Britain may be able to reduce the extent to which the decrease of foreign demand will reduce British exports, and she may do this without reducing the sterling prices of her exports.

4. Changes in Level of Interest Rates in Britain Relative to Levels Elsewhere. Suppose that British interest rates rise relative to those elsewhere. This will at least reduce capital outflows from Britain and may induce inflows. Thus, by decreasing the supply of sterling or increasing the demand for sterling, it will tend to raise the sterling exchange rate. A fall of interest rates in Britain relative to levels elsewhere tends to have the opposite effect; that is, to reduce the demand for sterling and increase the supply of sterling for international capital flow purposes.

5. Changes in Expectations Concerning Future Sterling Exchange Rates. Changes in expectations may be very important in evoking speculative capital flows. Suppose, for example, that there arise expectations that the rate on sterling will fall sharply in the future. The demand curve for sterling may be shifted leftward and downward immediately as people postpone their purchases of sterling. The supply curve of sterling may be shifted rightward and downward as people sell sterling and buy foreign moneys. Both the decrease of the demand for sterling and the increase of its supply will bring about a decrease in the exchange rate on sterling. This decline of the sterling rate will, of course, stimulate British exports and discourage British imports.

What will be the economic effects of such a decline in the sterling rate induced by a speculative capital outflow from Britain? These depend in part on prevailing economic conditions. They may be welcome if the British economy is depressed. The decline of the sterling rate will shift the demand schedule upward for British exports at each price level in terms of sterling and thus stimulate British export industries. Also, by making imports more expensive in terms of sterling, it will discourage British imports and enable import-competing industries to raise their prices. But suppose that the British economy is already under heavy inflationary pressure. The fall of the sterling exchange rate will intensify the pressure. The upward shift of foreign demands for British products will tend to raise their sterling prices. And the rise of the sterling prices of imports will add still further to British inflationary pressures.

On the other hand, newly created expectations of a future rise in the

price of sterling can lead to an immediate decrease in the supply of sterling, an increase in the demand for sterling, and a rise of the sterling exchange rate. This will tend, of course, to discourage British exports and stimulate British imports. Such a development would hardly be welcome when Britain was in a state of unemployment.

This discussion indicates one reason why nations do not like speculative capital flows that make their exchange rates fluctuate in an erratic manner. Such fluctuations can have serious effects on their export industries, their import-competing industries, their price levels, and their entire economies.

CONCLUSIONS

The preceding section showed how exchange rates could be determined and changed by supply and demand functions under a freely flexible exchange-rate system in which neither the central bank nor the government intervened to peg or otherwise influence directly the behavior of exchange rates. In the next chapter we shall consider exchange-rate systems in which the central bank or government pegs rates within narrow limits. Even in this case, however, the analysis presented above is highly relevant, for it helps explain how much gold and other international reserves the central bank and government will gain or lose in the process of stabilizing the exchange rate, what level of rates will prove to be tenable, and processes of equilibrating international receipts and payments.

19. International Monetary Policies

This chapter will deal with three principal topics: exchange-rate systems, methods of equating international receipts and payments, and interactions of developments in foreign-exchange markets and developments in the various national economies. Policy choices in these fields are highly important, not only for the behavior of international trade and capital movements, but also for the ability of nations to promote their domestic economic objectives.

EXCHANGE-RATE SYSTEMS

One important policy issue is the choice of an exchange-rate system. Here there are two broad alternatives:

1. **Pegged Exchange Rates Through Official Purchase and Sale of Gold or Claims Against Moneys.** Within this category there are significant variations. One policy may be described as, "Select an exchange rate and defend it indefinitely at all costs." The other, called *adjustable pegged rates*, assumes this attitude: "Select an exchange rate, peg it as long as the cost is not too great, but adjust the level of the peg if defense of the old rate becomes too costly in terms of output, employment and growth."

2. **Floating or Flexible Exchange Rates.** In extreme cases, the central bank and government do not intervene at all, but allow demand and supply conditions in exchange markets to determine rates. In other cases, they intervene—at least occasionally—to buy and sell so as "to correct disorderly movements" or to raise or lower rates. If governments and central banks do peg rates or otherwise intervene to affect their behavior, they face the problem of selecting the "proper" rate.

METHODS OF EQUATING RECEIPTS AND PAYMENTS

A closely related policy problem is that of selecting methods of dealing with deficits and surpluses in balances of payments. Suppose that a nation has a deficit in its balance of payments, which is obviously a surplus for the rest of the world. As shown in Table 19–1, each nation may respond in one or more of several ways.

TABLE 19–1. Methods of Dealing with a Surplus or Deficit in the Balance of Payments

1. Absorb it by allowing international reserves to change
2. Repress it
3. Eliminate it by adjusting
   (*a*) Exchange rates
   (*b*) Income levels
   (*c*) Relative price levels
   (*d*) Relative interest-rate levels

For example, the deficit country may absorb the deficit by allowing its international-reserve position to shrink. How long it can do this depends on the size of the deficit and the size of its international reserve and facilities for borrowing foreign moneys. It may repress the deficit by imposing direct controls on international trade and payments. For example, it may impose controls on all exchange transactions and may ration payments so that they do not exceed receipts, or it may impose higher tariffs or quantitative restrictions on imports and prohibit or limit capital outflows. Such measures can indeed equate international payments and receipts, but they have serious consequences for world trade and capital movements and for the efficiency of the world economy.

The deficit nation, together with the surplus nations, may eliminate the deficit. One way is to reduce the exchange rate on the nation's money. Other ways are to adjust income levels, relative price levels, and relative interest-rate levels.

These methods may be used singly or in various combinations. Policy choices in this field are closely interrelated with choices concerning exchange-rate systems. For example, to the extent that a country allows its exchange rate to change as a means of eliminating surpluses and deficits, it need not rely on the other methods. But if a country adamantly pegs its exchange rate at a fixed level, it must rely on the other methods. If its command over international reserves is limited, it can absorb deficits for only a limited period. And, if it is unwilling to repress trade and pay-

ments, it must fall back on adjustments of levels of income, prices, and interest rates.

Pegged Exchange Rates

One of the most common exchange-rate policies has been that of pegging exchange rates within narrow limits over considerable periods of time. The technique of pegging exchange rates, like that of pegging the price of wheat, the price of gold, or the price of a government security, is basically simple. A monetary authority or someone else stands ready to supply at some fixed price all the nations' money that is demanded from it at that price, and to demand at some fixed price all the nation's money that is offered to it at that price. Sometimes a monetary authority itself enters the exchange market and does the pegging. In other cases, it merely provides others with a means of doing so. Let us consider that latter case first.

Private Exchange Dealers. Private dealers in exchange will maintain virtually stable exchange rates between gold-standard moneys if the nations issuing those moneys stand ready to buy and sell gold at a fixed price and to allow gold import and export by private operators. For example, suppose that at some time the dollar is defined as 13.71 grains of pure gold. This is equivalent to setting a gold price of $35 an ounce, for an ounce contains 480 grains. Suppose that, at the same time, the British define the pound as 38.39 grains of pure gold. This is the same as setting a gold price of £12.5 an ounce. The mint parity, or par of exchange, will be £1 = $2.80. This is because the gold content of the pound is 2.80 times that of the dollar; or, to put the same thing another way, the dollar price of gold is 2.80 times the sterling price of gold. As long as both countries freely buy and sell gold at these fixed prices for international purposes, the dollar-sterling rate can deviate only slightly from this mint parity, or parity of exchange. This is because exchange dealers can acquire sterling by using dollars to buy gold and then sell the gold for sterling, and they can use sterling to buy gold and then sell the gold for dollars. For example, you might, if regulations permitted it, buy in New York 10,000 ounces of gold for $350,000. Suppose that the cost of shipping the gold to London, including your necessary profit, is $2500. The total cost of the gold delivered in London will be $352,500. You can sell the gold there for £125,000 at the official buying price. The cost of acquiring each pound in this way is 352,500/125,000, or $2.82. The exchange rate on the pound could not rise above this level because, at this rate on sterling, dealers would stand ready to supply all that might be demanded. The pound can rise higher and the dollar can fall lower

only if the United States ceases to sell gold freely at the fixed price for export, or if the British cease to buy it freely at the fixed price.

Similarly, dealers can buy £125,000 in exchange markets, use it to buy 10,000 ounces of gold in London, and sell the gold in New York for $350,000. Suppose that the cost and necessary profit to the dealer is $2500. His net realization will be $347,500, and his realization per pound will be 347,500/125,000, or $2.78. The exchange rate on the pound cannot fall below this level as long as exchange dealers can freely secure dollars by purchasing gold with sterling and using the gold to buy dollars. At this rate on sterling, dealers will buy all offered to them. However, the dollar can rise higher and the pound can fall lower if Britain ceases to sell gold at a fixed sterling price or the United States ceases to buy gold.

Monetary Authorities. Thus, we find that under the old type of international gold standard, the monetary authorities did not themselves have to enter exchange markets to maintain exchange rates within narrow limits. As long as they freely bought and sold gold at a fixed price, private exchange dealers stabilized rates. But note that a nation could prevent its exchange rate from falling only as long as it was both willing and able to supply sufficient gold for export at a fixed price.

In recent years, techniques for pegging exchange rates within narrow limits have come to differ in at least two respects from those described above. In the first place, monetary authorities rely less on the activities of private exchange dealers to set the limits, and they intervene in the exchange markets themselves. In the second place, they do not always use gold as an intermediary. Instead, as noted in an earlier chapter, they often buy and sell foreign moneys directly, using for this purpose their holdings of foreign moneys or current borrowings of foreign moneys. For example, an agency of the British government, the Exchange Equalization Account, prevents the exchange rate on sterling from rising above $2.82 and from falling below $2.78. Whenever the exchange rate on the pound rises to $2.82 (that is, when the rate on the dollar falls to £1/$2.82), it uses sterling to demand dollars. It may then continue to hold the dollars or it may exchange them for gold. On the other hand, when the exchange rate on the pound falls to $2.78 (the exchange rate on the dollar rises to £1/$2.78), it sells dollars in exchange for sterling. For this purpose it needs a sufficient supply of dollars, of gold that can be sold for dollars, of some other currency that can be sold for dollars, or an ability to borrow dollars.

If other demands for sterling and other supplies of sterling are such as to equalize the demand for, and the supply of, sterling at some rate between $2.82 and $2.78, the government authority need not intervene at

all. But the supply of sterling may exceed other demands for it at the support price. For example, at the rate £1 = \$2.78, the supply of sterling may become greatly in excess of other demands for sterling, so that the authority must sell large amounts of its gold and foreign-exchange holdings to buy up the excess of the supply of sterling over other demands for it. Such a situation is depicted in Fig. 19–1. If this disequilibrium continues for very long, Britain may be drained of all her holdings of gold and foreign exchange.

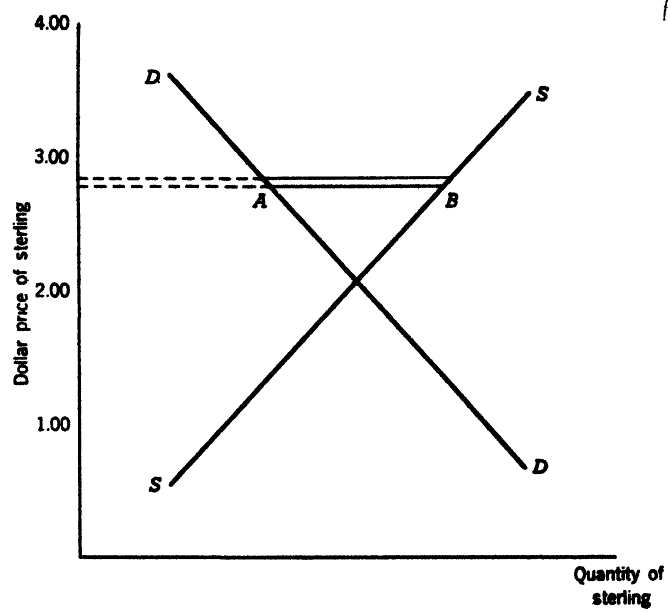

FIG. 19–1. Disequilibrium with Pegged Exchange Rates.

Equilibration of Receipts and Payments with Pegged Exchange Rates

What policy should a nation follow when it faces a disequilibrium in its balance of international payments and is balancing its receipts and payments only by drawing down its holdings of gold and foreign assets or by building up large short-term debts to foreigners? This is one of the most important policy problems in the entire field of international finance. The nation may, of course, lower its exchange rate to equalize the demand for, and supply of, its money in exchange markets. Or it may resort to direct controls over its trade and payments in order to hold its

payments down to the level of its receipts. Let us suppose, however, that Britain refuses to resort to a depreciation of her exchange rate or to restrictions on the freedom of trade and payments.

The drain on Britain's international reserves at the pegged exchange rate of £1 = $2.78 can be ended only by developments that will shift the demand curve for sterling upward and to the right, shift the supply curve for sterling upward and to the left, or shift both to a sufficient extent to equalize the demand for sterling and the supply of sterling at a rate equal to or more than £1 = $2.78. Several types of developments in other countries can assist in this process.

1. **A Rise of Price Levels Abroad.** A rise of prices abroad would increase the demand for sterling at each exchange rate by increasing the demand for British exports. It would also tend to reduce the supply of sterling by discouraging British imports.

2. **A Rise of Real Incomes Abroad.** This would shift the demand curve for sterling to the right.

3. **A Decrease of Interest Rates Abroad.** To the extent that this lessened capital flows out of Britain and induced or increased a flow of capital to Britain, it would reduce the supply of, and raise the demand for sterling.

All these developments could help to raise the demand for sterling relative to the supply of it and to ease the drain on Britain's international reserves.

However, if these developments do not occur abroad, or are not sufficiently strong to close the payments gap, one or more of the following things will have to happen in Britain.

1. **A Fall of British Price Levels.** This would tend to increase the demand for sterling by cheapening British exports and to decrease the supply of sterling by reducing British imports.

2. **A Fall of Real Income in Britain.** This would decrease British imports and the supply of sterling.

3. **A Rise of Interest Rates.** To the extent that this reduced the outflow of capital from Britain or increased capital inflows, it would tend to reduce the supply of sterling or to raise the demand for sterling.

Adjustments of precisely these types will tend to be made "automatically" if the deficit and surplus countries subject their monetary policies to the "discipline of their balance of payments" and "follow the rules of the international gold-standard game." These "rules" originally applied to international gold movements, but they are also applicable to a system of pegged exchange rates in which the central bank buys and sells foreign moneys, thereby tending to create and to decrease bank reserves within the country. The essence of these "rules" is that the

deficit country should allow its loss of gold or other international reserves to restrict its money supply, and that the surplus countries should allow their increases of gold and other international reserves to expand their money supplies.

Suppose that the deficit in the British balance of payments resulted from a decrease of its exports as other countries shifted their demand from British products to their home products. First, there are the "income effects." Both the decline of demand for its exports and the induced decrease of consumption expenditures at home serve to lower total demands for British output. In the surplus countries the opposite occurs; demands for their output are increased both by the shift from British products to home products and by the induced rise of consumption expenditures.

Then there are the monetary effects. As the Bank of England makes net sales of gold and foreign exchange, it reduces the reserves of the joint stock banks, thereby tending to restrict credit and to raise interest rates. It can accentuate monetary restriction by selling securities or calling loans. The monetary restriction and rise of interest rates in Britain serve both to attract funds from abroad (or at least to reduce outflows) and to lower domestic demands for output.

As central banks in the surplus countries make net purchases of gold and foreign exchange, they create reserves for their banks, thereby encouraging expansion of their money supplies and a decrease of interest rates. They can accentuate this if, as their international reserves increase, the central banks buy securities or expand their loans. The fall of interest rates in these surplus countries serves both to encourage outflows of funds to the deficit country and to increase demands for output in the surplus countries.

Such are the "automatic" processes of equilibrating international receipts and payments if both deficit and surplus countries follow these "rules of the game." Capital flows to the deficit country tend to be induced by both the rise of interest rates there and the fall of rates in the surplus countries. More fundamental is the fall of demands for output in the deficit country and the rise of demands for output in the surplus countries. Suppose first that money wage rates and prices are quickly and completely flexible and that changes in demands for output are reflected only in changes in prices. The fall of prices in the deficit country and the rise of prices in the surplus countries will serve to equate international receipts and payments by increasing exports and decreasing imports of the deficit country, and causing reverse effects in the surplus countries. Thus, if money wage rates and prices are quickly and com-

pletely flexible, international payments and receipts may be equated through adjustments of the price levels of the various countries.

What if money wage rates and prices are inflexible, at least in the downward direction? Changes in demands for output can still equate international receipts and payments, but by changing levels of real income. Increases of demands for output in the surplus countries can, by raising their real incomes, increase their demand for the exports of deficit countries. And the fall of demands for output in the deficit country can, by lowering its level of real output and income, decrease its expenditures for imports. The deficit country can become too poor to demand imports in excess of its current international receipts. In other words, it can eliminate the deficit in its balance of payments by creating a deficit in its real income or output.

It is easy to see why countries intent on promoting such domestic objectives as maximum employment and output, rapid economic growth, and price-level stability are often highly reluctant to follow "rules of the game," which require that their monetary and fiscal policies be dominated by their balance-of-payments and international-reserve positions. Countries with surpluses in their balances of payments are sometimes reluctant to expand their money supply for fear of inflationary consequences. Countries with deficits are even more reluctant to follow restrictive monetary and fiscal policies if this threatens their employment and growth objectives. They often take offsetting actions, such as central-bank purchases of securities, to prevent their loss of gold or other international reserves from restricting credit and raising interest rates.

However, if a country insists on pegging its exchange rates at a fixed level, and will not adopt restrictive fiscal or monetary policies despite a persistent deficit in its balance of payments, it is likely to be drained of its international reserves, to be forced to impose direct controls over its international trade and payments, or both.

SOME CONTROVERSIAL ISSUES

What should be the relative responsibilities of surplus and deficit countries for eliminating surpluses and deficits under an international system of fixed exchange rates? Deficit countries usually reply that the surplus countries should solve the problem by increasing their imports, by lending more, or by giving more aid. Surplus countries, on the other hand, often retort that the deficit countries should tighten their belts, show some self-discipline, and cease trying to live beyond their means.

Few would contend that surplus countries should make the adjust-

ment when they are already maintaining approximately full employment and stable or rising price levels, and when the deficits of the deficit countries are clearly attributable to their own highly inflationary monetary and fiscal policies. It would be too much to ask surplus countries to eliminate their surpluses by inflating prices as a rapid rate. A more appropriate remedy in this case is for the deficit countries to reform their domestic policies that created their deficits. This may include a realistic adjustment of their exchange rates, accompanied by domestic reforms.

Consider, however, a quite different case in which the deficit countries have relatively stable price levels and their deficits were created by a sharp fall of real incomes and output in the surplus countries. The surplus of the latter countries was created by the decline of their demands for imports. The deficit countries could, of course, eliminate their deficits by adopting deflationary policies to lower their levels of real incomes and prices. However, a more attractive alternative is for the surplus countries to adopt expansionary monetary and fiscal policies to raise their levels of real income and to increase their expenditures for imports.

The following rules of conduct seem appropriate under a system of fixed exchange rates:

1. A deficit country undergoing domestic inflation should solve both problems by adopting restrictive monetary or fiscal policies.
2. A surplus country with domestic output and income well below full-employment levels should solve both problems by adopting expansionary monetary or fiscal policies.

Unhappily, there are many situations not covered by these rules. For example, suppose some countries have large surpluses in their balances of payments along with actual or threatened inflation, while others have deficits in their balances of payments despite the presence of unemployment and excess capacity at home. Should the surplus countries inflate still more to equate balances of payments? Should the deficit countries create still more unemployment to eliminate their deficits? A sensible alternative, if the imbalance of international payments is large and persistent, would be to adjust exchange rates.

Adjustable Pegged Rates

Adjusted rates involve a system of pegging exchange rates in the fashion already described, but with this difference: The nation does not commit itself to maintain a particular pegged rate indefinitely and at whatever cost. The pegged level may be adjusted to correct a "fundamental disequilibrium." The nation will maintain a fixed rate and adjust its receipts and payments in other ways as long as these adjustments are

not "excessively costly." But, if it should appear that the stable rate could be defended only at excessive costs in terms of inflation, or of unemployment and deflation, it will adjust the pegged rate to correct the fundamental disequilibrium and then maintain the new pegged rate until it becomes too costly to defend. This is the exchange-rate policy embodied in the Bretton Woods agreements. The precise meaning of such a policy varies from country to country. Some will make great sacrifices to defend a pegged rate; others will drop the peg whenever its defense becomes slightly painful.

The advantages claimed for this policy are that it affords a country the benefit of stable exchange rates in the short run, while protecting it against excessively costly adjustments of its levels of income, prices, and interest rates. But it also has disadvantages: (1) Fear that a country may lower the peg may inhibit the flow of capital to it, and this can be serious for a country that aspires to be an important international financial center, or that wishes to borrow heavily abroad; and (2) the country may suffer serious speculative capital outflows and losses of international reserves if people come to suspect that it may lower its exchange rate.

Free-Floating Rates

Under the free-floating policy, there is no official pegging of exchange rates and no official intervention to influence their behavior; they are determined by the market forces of supply and demand. The great advantage claimed for this policy is the freedom it affords a nation in its domestic policies. Undeterred by considerations relating to stability of its exchange rate and the status of its international reserves, the nation can promote to the utmost its domestic objectives and allow appropriate adjustments of its exchange rate to equilibrate its international receipts and payments. Some economists believe that under such a policy, exchange rates would behave in an orderly way, and that speculation would be predominantly of a stabilizing type. Others are far less optimistic; they fear that speculative movements would be erratic and often destabilizing.

Floating Rates with Official Intervention

With the floating-rate type of policy, the authorities do not peg exchange rates, but they do intervene at times to buy and sell the nation's money in exchange markets to influence the behavior of its exchange rate. These operations are usually carried out by a nation's government, central bank, or exchange authority.

Official purchases and sales in the exchange market may have the very

limited objective of preventing erratic or disorderly fluctuations of exchange rates without altering the basic level or trend of those rates. But they may also be used to lower or raise the level of rates over a longer period. For example, an authority may sell large amounts of its nation's money in exchange markets in order to keep its exchange rate lower than it would otherwise be. The only limitation on its ability to do this may be its willingness to accumulate gold and claims against foreign moneys. On the other hand, it may purchase large amounts of its own money to keep its exchange rate higher than it would otherwise be. Its ability to do this is limited by its ability to command gold and foreign moneys.

Exchange-Rate Adjustments

Changes in exchange rates are sometimes a highly useful device for equilibrating international receipts and payments. They are especially appealing to a nation as a method of escaping or minimizing the importation of inflationary or deflationary pressures from the rest of the world. Suppose, for example, that at a time when the British economy is already operating at practically full-employment levels, a highly inflationary situation develops in the United States and several other economically powerful countries. If Britain maintained stable exchange rates, the sterling prices of her imports would rise proportionally with price levels abroad, as would also the sterling prices of her exports. Britain could escape at least some of these inflationary pressures by raising the exchange rate on the pound. Suppose that foreign price levels double. The sterling price of British imports need not rise at all if the exchange rate on the pound is also doubled; that is, if the pound will buy twice as many units of foreign money. Moreover, the doubling of the exchange rate on sterling would make British exports twice as expensive in foreign moneys without any increase in their sterling prices.

Suppose, on the other hand, that the rest of the world slides into depression with falling price levels and that its demands for British exports, as expressed in foreign moneys, shift sharply downward. If the exchange rate on sterling remains unchanged, the sterling prices of British imports will fall, thereby putting British import-competing industries under deflationary pressure. Also, the decline of foreign demand for British exports will be fully reflected in sterling prices for exports. However, an appropriate decrease of the sterling exchange rate, reflected in a rise in the sterling cost of foreign moneys, may prevent the sterling prices of imports from falling. It will also cheapen British exports in terms of

foreign moneys without a decrease in their sterling prices and will offset (at least in part) the decline of foreign demands.

Variable exchange rates are not, however, without their disadvantages and possibilities of abuse. For one thing, they increase the risk of international trading and lending. Sellers who accept claims against foreign moneys in payment run the risk that the exchange value of those moneys will fall. Buyers who must pay in foreign moneys run the risk of having to pay high prices for those moneys. Forward exchange markets and speculative activities in them can lessen the burden of these risks, but these facilities are often inadequate and expensive. They are usually not available at all to bear the exchange risks on long-term lending and borrowing.

Members of a nation whose money is expected to depreciate in exchange markets find it very difficult to secure foreign loans in return for their promises to pay interest and principal in terms of their own money. For example, United States investors would be most reluctant to lend in return for promises to pay Brazilian cruzeiros or Argentine pesos in the future. Loans repayable in dollars may not solve the problem. For one thing, a Brazilian borrower may be unwilling to commit himself to pay dollars in the future when there is a possibility that the cruzeiro price of dollars will rise more than the cruzeiro price of the assets that he purchased with the loan. Moreover, this possibility may cause United States lenders to consider the borrower less credit-worthy.

Variations of exchange rates can also be abused. For example, nations may engage in competitive exchange depreciation in attempts to achieve nationalistic goals. This can occur even in times of prosperity. Accepting the old mercantilist doctrine that it is more blessed to export than to import, nation A may drive down its exchange rate to promote its exports and to give greater protection to its import-competing industries. Nations B, C, and D may retaliate. They may do this despite the fact that their balances of international payments are in equilibrium or are quite favorable. Such competitive exchange depreciation is more likely in times of unemployment. Suppose, for example, that because of purely domestic developments, such as a decline of domestic investment, nation A slides into a depression. It could combat the decline with measures increasing domestic demand. But it chooses instead to try to solve its domestic problem by driving down its exchange rate, thereby promoting its exports and decreasing its imports. This obviously tends to reduce nation A's demands for the output of other countries and to divert demands from other countries to the export industries of A. Other countries may retali-

ate, each trying to make its exports cheaper than the others and to give still more protection to its import-competing industries. This is a game in which everyone cannot win, but everyone can lose if the result is to demoralize world trade.

Under some conditions, changes of exchange rates can be a costly and even an ineffective method of equilibrating a nation's receipts and payments. To illustrate the principles involved, let us consider a case in which Britain lowers the sterling exchange rate to eliminate an excess of her international payments over her receipts. In this case, we shall measure both British payments and British receipts in terms of dollars. Note that this action operates through the price elasticity of the British demand for imports and the price elasticity of the foreign demand for British exports. This process may operate very smoothly if both price elasticities are high. If the British demand for imports is highly price-elastic, a small rise of the exchange rate on the dollar may decrease markedly both the physical volume of British imports and the dollar value of her imports. If the foreign demand for British exports has a price elasticity far above unity, a small reduction of their dollar prices will be much more than offset by the increase in their physical volume, so that the dollar value of British exports will rise markedly. In such a case, only a small reduction of the sterling exchange rate may be sufficient to eliminate the excess of British dollar payments over her dollar receipts.

At the other extreme, a reduction of the sterling exchange rate may actually increase the excess of British dollar payments over her dollar receipts. Suppose that the British demand for imports is highly price-inelastic, so that each rise of the exchange rate on the dollar reduces the volume and dollar value of British imports very little. Suppose also that the price elasticity of the foreign demand for British exports is far below unity. The decrease in the dollar price per unit of British exports will not be compensated by a sufficient increase of their volume, and British dollar receipts for exports will fall. British dollar receipts may be reduced more than her dollar payments, so that the excess of her payments is accentuated.

In intermediate cases, price elasticities may be such that a nation's payments and receipts can be equilibrated by a reduction of its exchange rate, but only by a very large reduction. In such cases, the nation may suffer a serious worsening of its "barter terms of trade." By this we mean the quantity of real imports that it can buy with each unit of its real exports. Its barter terms of trade vary with the ratio:

$$\frac{\text{Price of exports}}{\text{Price of imports}}$$

Suppose, for example, that as Britain lowers the sterling exchange rate, the dollar prices of her imports change hardly at all, but that the dollar prices of her exports fall almost proportionally with the exchange rate on sterling. (This would happen if the sterling price of exports remained constant.) In thise case, the effect is to lower drastically the dollar prices of her exports relative to the dollar prices of her imports. Her barter terms of trade could be worsened so much that even a much greater real volume of exports would buy only a smaller real volume of imports. The result can be a lowering of the country's standard of living, even though its physical output is sustained or increased. Fear of worsening barter terms of trade is one reason why countries may be reluctant to lower their exchange rates to equilibrate their receipts and payments.

EXCHANGE RESTRICTIONS AND OTHER DIRECT CONTROLS

Our discussion of methods of equilibrating balances of international payments has assumed up to this point that there are no official restrictions on international transactions and payments. However, governments can take various types of direct action that affect the nation's payments, receipts, exchange rates, and international reserves. In some cases, these actions are taken primarily for other reasons, and their effects in exchange markets are incidental. In others, they are taken primarily because of their effects in exchange markets.

These direct actions are of various types, of which the following are merely examples:

1. *Increased tariffs on imports.* By increasing the cost of imports, these may reduce the nation's imports and its demand for foreign moneys.
2. *Quantitative restrictions on imports.* These take various forms. A nation may put only a few types of imports under quota, or it may go as far as to prohibit all imports except those specifically licensed by the government.
3. *Taxes on exports, subsidies on exports, and quotas on exports.* These are other actions taken.
4. *Restrictions on exchange transactions.* These merit more detailed consideration.

Exchange Restrictions

Exchange restrictions apply to any departure from a system of free, multilateral, international payments. It therefore includes all restrictions on the types of transactions in exchange markets, the prices that may be received or paid for moneys, the use of receipts from abroad, the purposes

for which international payments may be made, and so on. The first widespread use of exchange restrictions in peacetime came during the Great Depression of the 1930s. Many nations adopted them as world trade shrank, capital movements became disorderly, balance of payments problems multiplied, and exchange-rate stability was threatened. During World War II, all belligerent and most neutral countries instituted comprehensive systems of exchange control. In the typical case, receipts from abroad had to be surrendered at a fixed price to the central bank or an official exchange-control authority, no one could make a foreign payment without official permission, and both the types and amounts of foreign payments were strictly limited. At the end of the war, many countries were exercising strict control over all exchange transactions, and were pegging exchange rates at levels that could not be supported if freedom of international payments were restored. One of the major problems since World War II has been that of lessening these restrictions, so that greater freedom of trading and lending could be restored. Most have now been removed, but some remain.

Exchange restrictions vary greatly as to their comprehensiveness and their severity. In the early 1930s, their initial purpose in many cases was only to prevent abnormal capital flows out of a country—to prevent speculative flights into foreign moneys. Countries often insisted that they wished to preserve normal short- and long-term capital movements to finance international trade and investment. These restrictions had several closely related purposes: to protect the size of the country's international reserve, to enable it to use these reserves for more important purposes, and to prevent or to lessen the decline of the nation's exchange rate.

The problem of preventing "abnormal" capital movements, while maintaining "normal" capital movements, turned out to be extremely difficult. In practice, it is often virtually impossible to distinguish between normal and abnormal transactions. Further, as soon as a nation refuses to allow foreign withdrawals of funds, its ability to attract new funds from abroad is greatly reduced. Finally, these restrictions can be enforced effectively only with a large organization and strict supervision of all exchange dealings, for funds can be withdrawn from a country in many ways. For example, funds were smuggled out of Germany in a number of ways. People made automobile parts and accessories out of gold and silver, painted them over, and drove the cars to Switzerland. They smuggled jewelry out of Germany and sold it abroad. German exporters underbilled their foreign buyers and made arrangements for the excess funds to be placed in accounts abroad. German importers overpaid their

foreign suppliers and arranged for the extra funds to be held abroad for them.

The difficulty of regulating capital exports was but one reason why many nations came to apply exchange restrictions to virtually all types of international transactions. Perhaps more important was the feeling that these restrictions were a useful method of defending exchange rates, of protecting international reserves, of protecting home industries, and regulating all types of international trading and lending. A complete exchange-control system usually includes the following:

1. The government fixes the exchange rate on its money considerably above the level that would prevail in a free market.
2. Exchange dealings are centralized in the government and its authorized agencies.
3. All recipients of receipts from abroad are required to sell them to the exchange authority at the official rates.
4. No payment can be made abroad for any purpose without a permit, and in most cases an allocation of exchange, from the exchange authority.

Almost uniformly, an exchange rate pegged under a system of exchange controls overvalues the nation's money; the pegged rate is above that which would prevail with freedom of payments. For example, a South American country may peg its exchange rate at 1 peso = \$0.20, or \$1.00 = 5 pesos when the market rate would be \$1.00 = 10 pesos if the market were free of restrictions. At the pegged rate, the supply of pesos will exceed the demand for pesos; the demand for foreign money will exceed the supply of it. Such a situation has important implications. For one thing, the overvaluation of the peso, which makes the country's exports more expensive to foreign buyers, is likely to depress the nation's total export earnings. And, since its capacity to pay for imports may be limited to the value of its exports, its imports are also depressed. For another, since the demand for foreign money exceeds the available supply, the exchange authority faces a rationing problem. Finally, the presence of exchange restrictions and an excess demand for foreign moneys makes likely the development of a black market in foreign exchange. Those whose demands are not fully met by allocations from the exchange authority may seek additional supplies elsewhere and be willing to pay higher prices for them.

Exchange Rationing

Let us now look at some of the problems of exchange rationing, assuming that the authorities are largely successful in maintaining a single exchange rate. Faced with an excess of demands for foreign exchange

over available supplies, the exchange authorities must give answers to questions such as: How much do we allocate to each individual, business firm, and governmental agency wanting to make payments abroad? How much do we allocate for each general type of payment; how much for payment of debts abroad, how much for payments of interest and dividends, how much for foreign investment, how much for foreign travel, and how much for each of the various types of goods and services that might be imported? Should we merely ration by type of payment, or should we also ration payments to individual countries? And, if the latter, what volume of payments should we permit to be made to each country?

Experience with exchange control and exchange rationing has varied from country to country, but there have been many common problems. One is that of maintaining fairness and honesty in rationing foreign exchange among competing individuals and business firms. When the total value of imports is limited, an allocation of foreign exchange can be extremely valuable. For example, an importer might buy an American car for $2500 and sell it in his own country for the equivalent of $15,000, if but little foreign exchange is allocated for auto imports. If the government does not capture this excess profit with an import tax, the importer may share it with government officials. Friendships, family ties, political affiliations, and financial generosity to government employees and officials have too often played important roles in exchange rationing.

In general, countries have severely restricted exchange allocations for payments of foreign debts and transfers of interest and dividends. They have classified some types of imports as "essentials" and have given them preferential allocations while discriminating against "nonessentials." Domestic political considerations often influence these classifications. For example, imports that would compete with the output of politically powerful domestic industries are discriminated against, whereas exchange allocations for imports that are noncompetitive are more generous.

Exchange allocation policies have also been used as an instrument for forcing bilateral trade balancing. Thus, Argentina has favored payments to Britain over payments to the United States, because the British are better customers for its exports. Germany used exchange rationing during the 1930s for political and military purposes. Payments to countries evidencing "the proper attitude" were permitted on a liberal scale, but payments to other countries were niggardly.

These examples should suggest how powerfully exchange-rationing policies can influence a nation's internal structure of production and prices, and the types and directions of its international trade.

Multiple Exchange Rates

We noted earlier that there can be but one exchange rate on a nation's money at any time if exchange dealings are free of restrictions. But more than one rate becomes possible as soon as restrictions are imposed; those whose demands for foreign money are not fully satisfied at the official rate may be willing to pay a higher rate. In our foregoing example, those whose demands for dollars are not fully met at the official rate of $1.00 = 5 pesos, may be willing to pay 10 pesos or even more for extra dollars. Also, some of those who own or can get dollars will try to avoid selling them at the official rate of 5 pesos, and will make them available in the black market at some higher price. In many cases, these black markets become well organized even though they are illegal. Let us suppose that the black-market rate becomes $1.00 = 10 pesos. The initial reaction of exchange-control authorities toward black markets is usually one of strong opposition; they want the entire supply of foreign money surrendered to them. After a time, however, some of them come to believe that the black-market rate provides a useful way of stimulating exports. For example, some of the nation's exporters may not be able to compete successfully if they have to sell their dollar receipts at the official rate of 5 pesos to the dollar, but they will increase their exports markedly if they can sell their dollars at the black-market price of 10 pesos. The exchange authority may therefore wink at such an "informal depreciation" of the peso in a limited number of transactions. Later, it may formally set up a legal multiple exchange-rate system.

Some of these multiple exchange-rate systems are extremely complex. Let us use a simple system to illustrate the principles involved. Suppose that a South American country retains the "official rate" of $1.00 = 5 pesos and establishes two additional rates: an "export rate" of $1.00 = 7 pesos and a "free rate" of $1.00 = 10 pesos. If demands for dollars are not fully met at these prices, a higher black-market rate on dollars may appear. The exchange authorities then define the types of dollar receipts and payments to which each of the official rates applies. Multiple exchange rates are a powerful instrument.

Let us see first how multiple buying prices for dollars can be used to influence the nation's exports and dollar receipts. If the exchange authority wishes to discourage its nationals from borrowing abroad, it may force them to sell borrowed dollars at the official rate of 5 pesos, but if it wishes to encourage capital inflows, it may purchase borrowed dollars at the export rate of 7 pesos, or even at the free rate of 10 pesos. The rates paid for dollars received for exports usually depend on the type of export involved. Dollars received for some types of exports must be sur-

rendered at the relatively low official price of 5 pesos. These are usually exports that can compete successfully at that rate and for which the foreign demand is believed to be relatively price-inelastic. The authorities may believe that the nation's dollar earnings will be greater if foreigners must pay 20 cents for each peso than they would be if fewer cents would buy a peso. Dollar receipts for certain other types of exports may be purchased at the export rate of 7 pesos. This may both raise the peso price of the exports and lower their dollar prices. Dollar receipts for certain highly favored types of exports may be purchased at the high free rate of 10 pesos.

Multiple exchange rates also affect a nation's payments and imports. If the authority wishes to encourage a certain type of payment, it supplies foreign money at a low price; if it wishes to discourage a certain type of payment, it charges a high price for the foreign money. For example, if it wishes to discourage payments of foreign debt and transfers of interest and dividends, it may sell dollars for the purpose only at the high free rate of 10 pesos. Thus, it is enabled to repay a given peso obligation with fewer dollars. To encourage certain types of "essential" imports, and to hold down their peso prices, it may sell dollars at the low official rate of 5 pesos. These may be things imported for government use, for machinery or supplies to promote economic development, for raw materials used in producing exports, or for essentials that enter into the cost of living. But dollars to pay for other imports may be available only at the export rate of 7 pesos, or at the free rate of 10 pesos. These imports may be discriminated against because they are "nonessentials," or their peso prices may be forced up to help import-competing industries. For example, dollars to pay for steel imports may have to be bought at the free rate of 10 pesos to afford protection to the nation's budding steel industry.

Multiple selling rates have also been used to regulate the sources of imports. To encourage imports from selected countries, the authority provides foreign exchange at a low price. To discourage imports from other areas, it provides foreign exchange only at very high prices.

Summary

Brief and incomplete as it is, this account of exchange restrictions should indicate the power and breadth of their influence. They are indeed a wide departure from the old system of free, multilateral, international payments. Their original purpose was primarily to equilibrate international receipts and payments, to protect international reserves, and to avoid or to lessen the extent of exchange-rate depreciation. But once they were highly developed and made applicable to virtually every

type of international transaction, they came to be used for many other purposes as well—not only to limit total imports, but also to regulate types and sources of imports and the relative prices of imports; to protect import-competing industries in varying degrees and to build up new domestic industries; to regulate the types of exports and to subsidize or penalize various types of exports; to bargain with other countries and force bilateral balancing of trade and payments; and so on. The very existence of these restrictions, and the possibility of their use to prevent or to limit repayments of foreign debt and transfers of interest and dividends became a drag on international capital movements. Such restrictions not only reduce the total volume of world trade, but also misdirect it and prevent the achievement of the most efficient types of regional specialization in production. It is therefore easy to see why those who value highly the advantages to the world of free multilateral trade and payments work toward elimination of exchange restrictions and toward reliance on other methods of equilibrating international receipts and payments.

CONCLUSIONS

We have now completed our survey of the international monetary system and of international monetary interrelationships and policies. Especially emphasized were the international reserve system, the exchange-rate system, and methods of equilibrating international receipts and payments. Each of these fields presents many policy problems with important implications, not only for international trade and capital movements, but also for the behavior of output, employment, and prices in the various countries. And policy choices in any one of these fields has significant consequences for the others.

Among the more important policy problems are the following:

1. **International Reserve System.** Among problems in this area are:

(a) How much international liquidity does each nation and the world need to avoid deflationary or inflationary consequences, and at what rate should it grow as world production and trade expand? The answer depends in part on the exchange-rate system and on the readiness of nations to eliminate deficits and surpluses in balances of payments. The needed amount of liquidity may be huge if exchange rates are rigidly pegged over long periods and of nations are unwilling to take quick and effective action to eliminate deficits and surpluses. But it is likely to be much smaller if exchange rates are flexible or if other actions are taken quickly to equilibrate payments.

(b) What should be the forms and proportions of the various sources of international liquidity? What should be the roles of gold, of holdings of foreign moneys, of borrowing facilities? Should the present system be supplemented or replaced by an international central bank with power to create international reserves?

(c) In what amounts, under what conditions, and on what terms should borrowing of international reserves be made available to deficit countries?

2. Exchange-Rate System. Questions to be answered are: Should exchange rates be rigidly pegged over long periods at whatever cost? Should they be pegged, but adjusted if their defense becomes costly? If so, what should be the criteria for their adjustment? Should they be allowed to float without official intervention or be flexible with intervention? If there is to be official intervention, for what specific purposes and on what criteria?

3. Mechanism for Eliminating Deficits and Surpluses. Two important questions are:

(a) What should be the relative roles of direct controls over trade and payments, adjustments of exchange rates, and adjustment of incomes, prices, and interest rates?

(b) What are the relative responsibilities of surplus countries and of deficit countries?

4. Cooperation Among Nations. The following questions apply.

(a) Since the monetary, fiscal, and other policies of each country inevitably affect others even if they are adopted "for purely domestic reason," should each take these international effects into consideration?

(b) If countries are to cooperate on such matters, what should be the guiding principles and relative responsibilities?

These are but a few of the questions of international monetary policy that the world still faces.

VI. Monetary Policy

20. United States Monetary Policies, 1914 to 1929

With this chapter, we begin a lengthy discussion of monetary policy, with special emphasis on American monetary policies since the establishment of the Federal Reserve system in November, 1914.

As noted earlier, the formulation and execution of monetary policy involve at least three elements:

1. Selection of objectives: the choice of goals or purposes to be promoted
2. Development and use of monetary institutions and instruments to promote the chosen objectives
3. The use, at least implicitly, of some theory as to the economic effects of the various possible monetary actions

We shall be interested in the evolution of all these elements in monetary policies. What have been the objectives or goals of our policies? How have these changed through time, and why? How have changing goals affected actions? How has the Federal Reserve developed its control instruments and how has it used them? In what ways or for what reasons has it changed its use of instruments? What types of monetary theory seem to be the bases for its policies, and how have these changed through time?

The purpose of this and subsequent chapters is not only to tell the story of past episodes; it is also to give us an opportunity to analyze policy formation and execution in specific situations, to provide a basis for understanding the present status of monetary policy, and to emphasize that monetary policy is continuously—and, at times, discontinuously—in process of change.

BACKGROUND

When Congress passed and President Wilson signed the Federal Reserve Act in late 1913, the international gold standard was in its heyday. Gold had achieved its status as a truly international monometallic standard only in the latter part of the nineteenth century. Few economically important countries other than Great Britain were on gold standards before 1870; most of them were on silver or bimetallic standards. But the last 30 years of the nineteenth century and the first few years of the twentieth saw gold triumph (see Table 20–1). The United States put its new gold standard into effect in 1879.

The first years of the new gold standard were stormy ones, especially in

TABLE 20–1. Dates of Adopting Gold Standards[a]

Great Britain	1816	Holland	1875
Germany	1871	Uruguay	1876
Sweden		United States	1879
Norway	1873	Austria	1892
Denmark		Chile	1895
France		Japan	1897
Belgium		Russia	1898
Switzerland	1874	Dominican Republic	1901
Italy		Panama	1904
Greece		Mexico	1905

[a] The dates are approximate only, for some of the countries made the change from bimetallism or silver monometallism to gold in several steps.

the United States. This was primarily because they were years of deflation. The United States had followed highly inflationary monetary and fiscal policies during the Civil War; these were reflected in a doubling of the price level and in a fall of about 50 percent in the gold value of the inconvertible paper dollar. It was decided that prices would have to fall so that the dollar could again be given its old prewar gold value of 23.22 grains. When the latter was done in 1879, the price level had already fallen more than 50 percent below its Civil War peak. But the price decline did not end at that point; it continued into the 1890s. Those who opposed falling prices joined forces with those who were infuriated by "The Crime of '73" and wanted to "do something for silver" in condemning the gold standard and in demanding more money of almost any sort: more greenbacks, more silver money, and more of anything that would bring the price decline to an end and help silver. Then, almost abruptly, the clamor subsided at the end of the century and the brief "golden age of gold standards" began. This was due in part to an upsurge

in the growth of banking, but more to an upsurge in gold production, following the invention of the cyanide process of amalgamation and the new gold discoveries in the Rand district of the Transvaal and in the Klondike-Yukon area. The world's rate of gold production during the early years of the twentieth century was more than three times that in the period preceding 1896. The total money supply in the United States (coins, paper money, and checking deposits) tripled between 1896 and 1914, and wholesale prices rose more than 40 percent. Occasional complaints against the rising cost of living were lost among the praises of prosperity.

Those responsible for enacting the new Federal Reserve legislation had no intention of modifying basically the existing monetary standard. They implicitly assumed that the new system would operate within an international gold-standard framework and probably that it would follow the old rules of the international gold-standard game. What they could not know was that, before a year was out, and even before the new Federal Reserve banks could be organized and opened for business, the old type of international gold standard would be a thing of the past. World War I broke out at the beginning of August, 1914, and carried almost all countries into inflation and off gold standards. Until 1925, only the United States and a very few other countries were on gold. During this period of more than 10 years, the old rules of the international gold-standard game were irrelevant, for there was no such standard. And the new standards that were established in the latter half of the 1920s were far different from those of the prewar period. In the meantime, the Federal Reserve had faced the task of helping finance a major war.

THE PERIOD OF UNITED STATES NEUTRALITY, 1914 TO 1917

The war had already broken out in August before the Federal Reserve banks first opened for business in November, 1914. One of the first effects of the outbreak was to create crises in almost all financial markets, including those in the United States. Several forces combined to produce crisis conditions here: the necessity of repaying large, short-term debts to London, the unavailability of new credits from Europe, large foreign sales of securities on the New York Stock Exchange, German threats to ocean shipping and interruption of United States exports, domestic cash withdrawals from banks, and withdrawals by banks in the interior of some of their deposits with their city correspondents. At times, it was feared that a full-fledged banking panic would occur and that gold payments would have to be suspended. The worst had passed, however,

when the Federal Reserve banks opened in November. By the late spring of 1915, the United States was enjoying an export boom. Demands for its products were becoming almost insatiable as neutrals turned to it for products formerly purchased in Europe and as the Allied Powers bought heavily to meet their essential civilian needs and to promote their war efforts. Between August 1, 1914, and the entry of the United States into the war in April, 1917, United States exports totaled $11,585 million, while its imports were only $5531 million, leaving an export surplus of $6054 million. Foreign buyers paid for these huge net purchases in three principal ways: They resold here $2000 million of their holdings of United States securities, borrowed $2375 million, and shipped $1100 million of gold. Since the United States gold stock had been only $1572 million at the beginning of the war, these imports increased it by nearly 70 percent. No one had ever anticipated such gold inflows. Both the great increase in the foreign demand for United States exports and the flow of gold into bank reserves created strong inflationary pressures.

During the period between the opening of the Reserve banks in late 1914 and the entrance of the United States into the war in April, 1917, Federal Reserve officials had no opportunity either to develop meaningful objectives or to use their instruments of control effectively. It was obvious to them that they should not, in response to the gold inflow, follow expansionary policies and enhance inflationary pressures. Yet they could do nothing to offset or to sterilize the expansionary effects of gold inflows. They had almost no assets to sell and they had no power to raise member-bank reserve requirements. They had to stand by while the money supply rose from $11.6 billion in mid-1914 to $15.8 billion in mid-1917. Wholesale prices had already risen more than 50 percent when the United States entered the war.

THE WAR PERIOD, 1917 TO 1919

With this country's entrance into the war, the Federal Reserve entered a new phase. The system that had been created to "accommodate commerce and industry" now became one to "accommodate the Treasury"; its dominant objective became that of assuring that the prosecution of the war would not be hindered by any lack of money, regardless of inflationary consequences. The government's fiscal policy was the one common to periods of major war—large deficits representing increases of expenditures far in excess of increases in tax collections. Federal expenditures rose from less than $750 million in 1916, to $18,515 million in fiscal 1919—nearly a 24-fold increase. For the three years ending June

30, 1919, they aggregated $33,190 million, a huge sum for those days. This great rise in the government's demand for output, occurring when the economy was already operating at near-capacity levels, enhanced inflationary pressures both directly and through its stimulus to private consumption and investment demands. Despite the imposition of many new taxes and increases in old ones, total tax collections in the three years ending in June, 1919, were only $9941 million, leaving a deficit of $23,248 million to be covered by new borrowing.

TABLE 20–2. Federal Receipts and Expenditures, 1916–1920
(in millions)

Fiscal Year Ending June 30	Expenditures	Receipts	Surplus (+) or Deficit (−)	Change in Treasury General Fund Balance	Change in Gross Federal Debt
1916	$ 734	$ 783	+$ 48	+$ 82	+$ 34
1917	1,978	1,124	− 853	+ 897	+ 1,750
1918	12,697	3,665	− 9,032	+ 447	+ 9,480
1919	18,515	5,152	− 13,363	− 333	+ 13,029
1920	6,403	6,695	+ 291	− 894	− 1,185
SUMMARY:					
1. Total for two fiscal years 1918–1919	31,212	8,817	− 22,395	+ 114	+ 22,509
2. Total for three fiscal years 1917–1919	33,190	9,941	− 23,248	+ 1,011	+ 24,259

The Treasury tried to borrow as much as it could in ways that would not involve an increase in the money supply. Employing a nation-wide organization, high-pressure Liberty Loan campaigns, and various types of propaganda, it called upon the American people and business firms to "Save and buy bonds!". However, its receipts from these sales were far too small to cover its needs, so it turned to types of borrowing that did require increases in the money supply. These were of two principal sorts:

1. Sales of Treasury securities, primarily shorter-term issues, to the commercial banks. This obviously involved an increase in the money supply, but the Treasury hoped, largely in vain, that it could later retire this money with borrowings from the public.

2. Sales of securities, largely of the longer-term varieties, to members of the public who would pay for them with money borrowed from the commercial banks. This, too, obviously involved an increase of the money

supply, but the Treasury hoped that this new money would gradually be retired as banks brought pressure on their customers to save and repay their borrowings.

The Federal Reserve played a central role in this process by meeting the greatly increased demand for currency in circulation, and by supplying the banking system with sufficient reserves to enable it to buy Treasury obligations, to lend to others for the purchase of Treasury securities, and to meet essential private demands for productive purposes. In sharp contrast to its policies during World War II, it did this to only a very small extent by purchasing government securities itself. It supplied the funds largely by lending to commercial banks. To do this, it set up "preferential discount rates" on Federal Reserve loans collateraled by Treasury obligations. These were preferential in the sense that they were below the discount rates applicable to loans secured by commercial paper. They were also below, usually about ¼ of 1 percent below, the coupon rates on the various types of Treasury obligations to which they applied. Thus, a bank could make a small profit by borrowing from the Federal Reserve and buying government securities, and also by borrowing to lend to customers at an interest rate equal to the coupon rate on the security bought and pledged by the customer.

Three aspects of this policy are important:

1. In effect, it enabled the Treasury to determine Federal Reserve preferential-discount rates, for it was the Treasury that determined the coupon rates on its obligations.
2. The preferential rates became the effective discount rates at the Federal Reserve banks. With great and growing holdings of Treasury obligations eligible for the lower preferential rates, banks would have been foolish to borrow at the higher rates applicable to commercial paper.
3. The Federal Reserve could not restrict the supply of credit for other uses while maintaining such ample credit supplies for the Treasury. Banks could secure reserves by borrowing on government securities and then lend as they saw fit.

The government's highly expansionary fiscal policy, and the Federal Reserve's "accommodating" monetary policy were accompanied by inflation and monetary expansion. By mid-1919, when the government's deficit spending came to an end, both Federal Reserve and commercial-bank credit had expanded greatly. In March, 1917, just before this country's entrance into the war, total Federal Reserve credit outstanding was less than $300 million. In June, 1919, it was more than $2500 million, of which $1800 million represented bank borrowings. The nation's total money supply, which had been $11.6 billion in mid-1914 and $15.8 billion three years later, had risen to $21.2 billion by mid-1919. The wholesale price level was 25 percent higher than it was just before the

entrance of the United States into the war and 95 percent above its level at the outbreak of the war.

Federal Reserve officials did not object to the domination of their policy by the Treasury's needs during the war itself or even during the period of continuing government deficits up to mid-1919. They, too, wanted to do everything they could to help win the war, and they recognized that the inadequate tax policy of the period necessitated borrowing from the banks and Federal Reserve support. But in the last three months of 1919, they grew restive and finally rebelled against Treasury domination. The Treasury's needs were now less urgent, for it was enjoying a small tax surplus. Moreover, inflation was again well under way. After some hesitation in late 1918 and early 1919, as the government's demand for output fell, the economy was again under strong inflationary pressures from rising export and private domestic demands. Speculation in both securities and commodities was widespread, both Federal Reserve and commercial-bank credit were expanding, and prices and wages were rising rapidly. This was no speculative bubble on the surface of the economy; it was a strong inflation that pushed up not only the prices of output but also wages and other elements of the cost structure. Under these conditions, Federal Reserve officials wanted to increase discount rates. The Treasury objected. Though it no longer had to borrow new money to cover current deficits, it insisted that its refunding operations should not be hampered by increases in Federal Reserve discount rates. Moreover, it wanted to avoid any further declines in the prices of outstanding Liberty Bonds. The controversy became prolonged and bitter. Gradually, however, the Treasury acquiesced and permitted a series of discount-rate increases, the first of which occurred in November, 1919. In several cases, its acquiescence was delayed and reluctant. By the end of May, 1920, discount rates at the various Reserve banks had been raised from their range of 4 to 4½ percent in the preceding October to a range of 6 to 7 percent.

The war and postwar inflation came to an abrupt halt in May, 1920. By then, however, price levels had risen markedly and both commercial-bank and Federal Reserve credit were greatly expanded. Wholesale prices were 140 percent above their prewar level. Total commercial-bank loans and investments had increased from $16.9 billion in mid-1914 to $36.3 billion, a rise of $19.4 billion, or 115 percent. Only 23 percent of this increase was in bank holdings of Treasury obligations; the remainder represented increased bank loans and holdings of private securities. Total Federal Reserve credit had risen to $3.4 billion, of which more than $2.5 billion was in the form of loans to banks. Thus, member banks entered

the postwar depression owing the Federal Reserve banks more than $2.5 billion, and on these borrowings they were paying discount rates of 6 and 7 percent.

POSTWAR DEPRESSION, 1920 TO 1921

The end of the war and postwar inflation in the United States was signaled in May, 1920, by a worldwide break in the prices of such basic commodities as silk, tea, coffee, and most agricultural products. The ensuing depression, which ran into early 1922, was relatively short, but sharp and painful. Wholesale prices in general fell 45 percent, and the prices of farm products 50 percent. Millions lost their jobs, and thousands of business firms were injured by decreased demands for their products and by declines in the values of their high-priced inventories. Farmers were hard hit. Many who had bought high-priced land on credit or who had accumulated high-cost livestock and grain inventories became insolvent, or nearly so. Thus, both the solvency and the liquidity of the economy were seriously weakened. And the commercial banks, owing the Federal Reserve about $2.5 billion on which they were paying interest rates of 6 and 7 percent, were in no position to offer easier credit.

It was April, 1921, about a year after the depression started, before the Federal Reserve took a single action to ease monetary and credit conditions. The Reserve banks did refrain from putting pressure on member banks to repay their borrowings; they wanted the liquidation to be orderly rather than abrupt and panicky. But they did not buy either government securities or acceptances to provide the banks with reserves and enable them to reduce their borrowings, and they did not reduce a discount rate until April, 1921. Such a policy now seems incomprehensible to those who accept the view that the major objectives of the Federal Reserve should be to promote price stability, maximum employment, and the highest sustainable rate of economic growth. Why did the Federal Reserve follow the policies it did in the depression of 1920 to 1921?

The answer has many parts, but a basic point to be made is that the Federal Reserve had not yet come to believe that it had the responsibility of using its powers aggressively to promote economic stability. This concept of its function developed during the next few years. But the Federal Reserve had several reasons for wanting some liquidation of credit. The most important of these was to protect and improve its gold-reserve position. In large part, its policy was the traditional one of a central bank facing a threat to its reserve position and to its ability to maintain the

redeemability of the nation's money in gold. The country's monetary gold stock had grown from $1.5 billion in 1914 to $2.9 billion in 1919. Moreover, a wartime campaign had succeeded in concentrating about three-quarters of the nation's gold in the Federal Reserve banks. A wartime embargo on gold exports prevented gold from flowing out until the embargo was lifted in the spring of 1919. Yet, by late 1919 and early 1920, the actual gold-reserve ratios of the Federal Reserve banks as a group were very close to the legal minimum. The New York Federal Reserve Bank actually had deficient reserves on several occasions and had to pay penalties on the deficiencies. Several of the other Reserve banks would have been in even worse reserve positions if they had not borrowed from the other Reserve banks. This sharp decline in the reserve ratios of the Federal Reserve banks was brought about largely by the great rise of Federal Reserve note-and-deposit liabilities during the period of expansion and inflation. But it was aggravated by small gold outflows following the lifting of the gold embargo early in 1919.

This episode is interesting in part because it was one of the two occasions in Federal Reserve history when a shortage of gold led it to restrict credit (the only other was in the fall of 1931). It is significant that the Federal Reserve did not lower its discount rates in 1921 until its reserve position had improved markedly.

There were also other reasons why the Federal Reserve did not earlier remove downward pressures on credit. One was the belief that banks should not permanently hold large amounts of government securities. They should, instead, sell these securities and concentrate on commercial loans. Still another was the belief that member banks should not remain continuously in debt to their Reserve banks. Also important was the fact that the Federal Reserve had not yet learned how to use open-market operations for general monetary management purposes.

The 1920 to 1921 episode was extremely painful for the country and the Federal Reserve. Within a few years, the Federal Reserve had so changed its objectives and its methods of operations that it would not have dreamed of repeating its policies of 1920 to 1921. Armed with ample gold reserves—and even threatened by a plethora of gold—it became an agency for economic stabilization.

THE POSTWAR WORLD

It was late 1921 or early 1922, when the Federal Reserve System was already more than seven years old, before Federal Reserve officials had an opportunity to develop anything like "normal" peacetime objectives and

methods of monetary management. During their first two and a half years, they had been powerless to prevent the flood of gold imports from feeding the inflation. From this country's entrance into the war until near the end of 1919, they had been chained to the objective of facilitating Treasury finance, regardless of inflationary consequences. Then, in 1920 and early 1921, their gold-reserve positions were so tight that they felt they had little freedom of action. Only now were they rid of the problem of financing a war, free of Treasury domination, and possessed of enough excess gold reserves and enough earning assets to enable them to regulate monetary conditions. But as the Federal Reserve officials sought to formulate peacetime objectives and to develop peacetime methods of operation, they did so under conditions that were never contemplated by the authors of the Federal Reserve Act and which made most of the prewar rules of central banking obsolete. The postwar world was far different from that of 1913.

The Federal Reserve Act contemplated that the new system would extend its credit almost exclusively on the basis of private-debt obligations. The Reserve banks would create funds primarily by lending to member banks on the basis of commercial paper, and even their open-market operations would be largely confined to acceptances. This was partly because of the theory that the supply of credit could be best adjusted to the needs of trade if based on short-term, self-liquidating loans for production and distribution purposes. But it was also partly because the supply of federal debt was so small; for some time, this debt had been less than $1 billion, and three-quarters of it was held as backing for national bank notes. All this was changed at the end of the war. The federal debt had grown to $25 billion and was widely held by all types of individuals and financial institutions. This altered the situation in many ways. In the first place, it increased the regional mobility of investable funds. These funds could now be shifted through interregional sales of government securities. In the second place, it enabled member banks to borrow on paper collateraled by Treasury obligations rather than commercial paper. In the third place, it provided the Federal Reserve with an excellent medium for open-market operations and facilitated the development and use of this powerful instrument.

Far more important, however, were the great changes in the world economy and in the relative position of the United States in that economy. The authors of the Federal Reserve Act implicitly assumed that the new system would operate within an international gold-standard framework and would in general abide by the old rules of the international gold-standard game. They had no reason to expect that the

United States would become a major regulator of the world's monetary system, for the United States was in fact a minor financial center in the prewar period. She was still a net debtor to the rest of the world, she had few facilities for international lending, and her supply of knowledge and expertness in international monetary and financial matters was very limited. London was the almost undisputed monetary and financial center of the world. Britain was the world's greatest trading country and the world's greatest net creditor. And London was the world's center for international loans, both short- and long-term, and for international payments. In effect, the Bank of England managed the international gold standard. It is but little exaggeration to say that gold was on the sterling standard.

All this was changed at the end of the war. The United States emerged more powerful than ever. Both by repurchasing American securities from abroad and by foreign lending, she had become a net creditor to the rest of the world. Her industries, unscathed by the war, were more productive than ever. Her national income was probably greater than that of all Europe, and she was the principal potential source of savings for international lending. Almost alone, she remained on a gold standard. Within a few years she held more than 40 percent of all the world's monetary gold, and stood in danger of receiving more.

Europe, the old center of economic and financial power, was in economic and political distress. Her productive power was seriously reduced—partly because of physical destruction through military action, unrepaired wear and tear of productive facilities, lack of fertilizers, and malnutrition of workers. But at least as devastating were social, political, and economic disorders. Many governments were unstable, revolutionary movements were widespread, and international disputes were common. Inflation was rampant and financial disorders the rule. All countries had abandoned gold standards and only a few had managed to re-establish them before 1925. Great Britain's position was seriously undermined. In addition to her heavy loss of manpower in the war, she had lost much of her shipping, had sold large amounts of her assets abroad, and had borrowed more to help finance her war efforts and those of her allies. She had been forced to abandon the gold standard, to which she did not return to until April, 1925. In the meantime, sterling exchange rates fluctuated widely. London was certainly in no position to play the role of manager of any sort of international gold standard.

Thus, the inexperienced Federal Reserve officials found themselves at the head of the world's most powerful monetary system with an inescapable power to influence, not only the purchasing power of gold through-

out the world, but also its distribution. By 1923, it was quite clear that, in the absence of an international gold standard, they could not follow the old rules of the game. By that time the nation's monetary gold stock had reached $3.7 billion and had increased $1 billion in the preceding 24 months. During the next two years, it rose another $500 million. Even if the Federal Reserve were merely to allow the "automatic" effects of gold imports to occur, an unwanted inflation might result. To reinforce these automatic effects by an expansion of Federal Reserve credit would compound the folly. The System, therefore, began a policy of "offsetting" or "sterilizing" the effects of gold flows except when, by coincidence, the effects of gold flows were consistent with the promotion of the System's objectives. But merely to reject the old rules of the gold-standard game—to ignore reserve ratios in determining policy—was not enough. Federal Reserve officials had to evolve new objectives and guides to take their place.

OBJECTIVES OF FEDERAL RESERVE POLICY

During the relatively short period, 1922 to 1924, Federal Reserve officials developed three main objectives or considerations that guided their policies during the remainder of the 1920s: (1) promotion of price-level stability and high and stable levels of business activity, (2) prevention of an excessive use of credit for speculative purposes, especially in the stock market, and (3) promotion of the restoration and maintenance of gold standards abroad. None of these objectives could be promoted by a Federal Reserve policy of passive accommodation; all required positive policies of regulation or control. It should be clear that no one of these objectives dominated Federal Reserve actions. When they came into conflict, as they sometimes did, Federal Reserve officials faced difficult problems of balancing and compromising.

PROMOTION OF PRICE AND BUSINESS STABILITY

Starting in about 1922, at the end of the postwar depression, the objective of promoting price-level stability and high and stable levels of business activity became one of the most powerful determinants of Federal Reserve policy actions. Federal Reserve officials insisted that monetary policy alone could not assure the achievement of either of these objectives, for monetary policy regulated only the supply and cost of credit, and the behavior of prices and business activity was affected by many factors other than credit. Yet, they insisted that the supply of

money and credit should be so regulated that it would not be a source of disturbance to the economy, and that it would contribute as much as it could to economic stability. This supply should be neither so small as to reduce prices, lower business activity, and hamper economic growth, nor so large as to induce price inflation.

On several occasions during the 1920s, Congress considered bills that would order the Federal Reserve to stabilize the general level of prices. All these were strongly opposed by Federal Reserve officials, who gave several reasons for this opposition.

1. Vagueness and Technical Defects of the Proposals. They criticized the ambiguity of the term, "the general level of prices," and noted the diverse behavior of the various price indexes. Mr. Charles Hamlin, a member of the Federal Reserve Board, observed in 1928: "For example, in the period from 1925 to 1927 the Bureau of Labor wholesale indexes show a price decline of about 12 percent; but if you take the curve of the cost of living, the decline was barely 2 percent. If you take a composite index like Mr. Snyder's, there was hardly any decline at all."[1] But Federal Reserve officials had more basic objections to the proposed legislation.

2. Not All Price Declines Are Undesirable. Though admitting that price declines are usually harmful, they insisted that those resulting from general increases in efficiency may be beneficial. Price declines accompanied by proportional decreases in costs need not decrease the profitability of production or lower the incentive to employ labor.

3. Price Changes Are but Tardy Indicators of More Basic Difficulties. Federal Reserve officials contended that changes in price levels may be poor guides to policy because they tend to appear only after basic maladjustments have been under way for some time. "Credit administration must be cognizant of what is under way or in process in the movement of business before it is registered in the price index. The price index records an accomplished fact."[2]

4. Concentration on Behavior of Prices. This might prevent the Federal Reserve from achieving other important objectives, such as the promotion of high and stable levels of business activity.

Though Federal Reserve officials opposed legislative mandates to stabilize price levels, they insisted that, in fact, their credit policies were designed to promote this objective as much as possible without an undue sacrifice of other objectives.

Figure 20–1 shows the extent to which the Federal Reserve related its policies to the behavior of industrial production, tightening credit when

[1] Hearings on H.R. 11806, 1928, p. 393.
[2] Federal Reserve Board, Annual Report, 1923, p. 32.

business activity was rising rapidly, and easing it when business was declining.

Restraint of Security Speculation

As indicated earlier, it was 1934 before the Federal Reserve acquired the power to regulate margins on loans for the purpose of purchasing and carrying securities. In the 1920s, it could curb the use of credit for

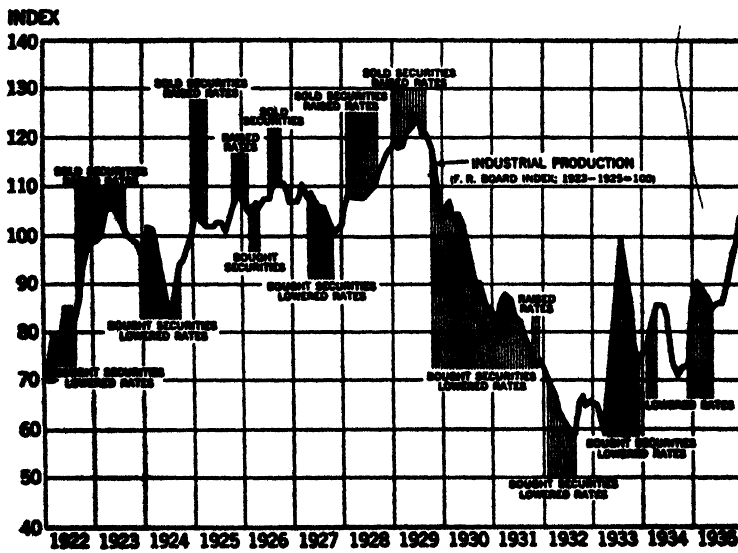

FIG. 20–1. Timing of Federal Reserve Open-Market Operations and Discount Rate Changes Compared with Changes in the Volume of Industrial Production. (Source: Reproduced from W. R. Burgess, *Reserve Banks and the Money Market*, copyright, 1927, 1936, 1946, by Harper & Row.)

security speculation only through general credit restraint or clumsy attempts at direct controls over the lending policies of member banks that were in debt to their Reserve banks. We shall see later how Federal Reserve attempts to curb stock speculation in 1928 and 1929 conflicted with other objectives, and prevented their attainment.

Restoration and Maintenance of Gold Standards Abroad

As noted earlier, and as indicated in Fig. 20–2, almost all countries abandoned gold standards during World War I and few returned within the first six years after the end of the war. At the beginning of 1924, only

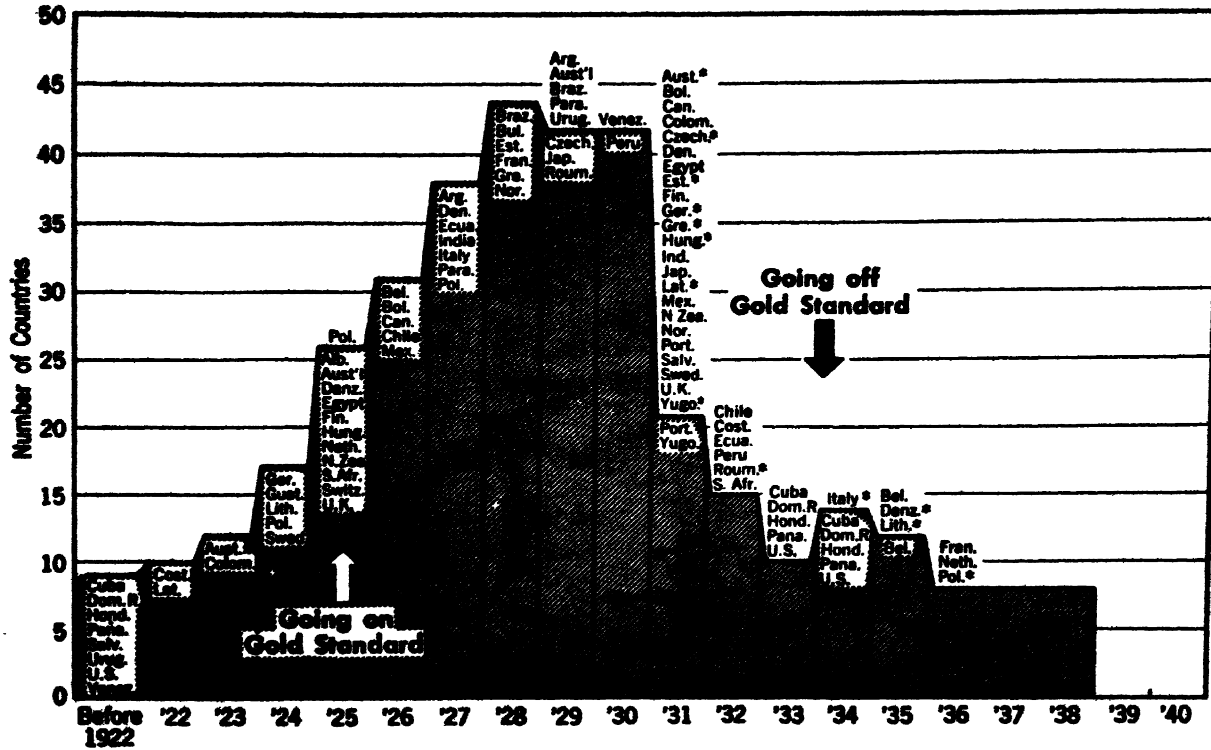

FIG. 20–2. Countries on the Gold Standard, 1921–1938. (Source: U.S. Treasury.)

the United States and a handful of small countries were on gold. A few others returned to gold during that year, but it was 1925 before a truly international gold standard began to reappear. In the meantime, monetary and financial disorders were widespread. Great Britain and some other countries succeeded in stopping inflation in 1920; in others, inflation continued until after the mid-1920s. In some, price levels merely doubled; in some, they rose eightfold; and in some extreme cases, they rose by the billionfold. All sorts of domestic difficulties promoted monetary disorder: extraordinary expenditures for reconstruction and reparations payments, political instability, unbalanced budgets, easy-money policies to help the finance ministers manage their huge floating debts, and so on. The international exchange market performed erratically. Exchange rates on the various national currencies fluctuated widely, reflecting not only changes in the domestic purchasing powers of those currencies but also erratic and speculative international shifts of funds induced by such things as expectations of further inflation, domestic and international political disturbances, and uncertainties arising out of the great complex of reparations and war debt obligations.

These countries wanted to return to gold standards. More, they wanted to end inflation and deflation at home, to restore more stable fiscal and monetary policies, and to achieve stability of their currencies in exchange markets. Still more fundamentally, they wanted to restore their productive power and achieve social and political stability. For this purpose, many of them needed loans or grants from abroad. In this whole process of stabilization and recovery, the United States could be most helpful. But the United States government of that day would not provide the necessary funds or even enter officially into cooperative international programs for such purposes. It might provide small grants in the early postwar period to prevent actual starvation and deal generously with its debt claims against its former allies, but it would not go further. This was partly because of United States isolationism, and partly because of the current philosophy that government should limit the scope of its activity. If United States funds were to be supplied for foreign reconstruction and stabilization purposes, they would have to come from the Federal Reserve and private sources.

It was under these conditions that the Federal Reserve System, under the leadership of Governor Benjamin Strong of the Federal Reserve Bank of New York, sought to assist both in the re-establishment of gold standards abroad and in making them function in an acceptable manner. The Federal Reserve had several reasons for desiring the re-establishment of an international gold standard. One was purely altruistic: Strong was

deeply sympathetic with those who had suffered during the war and postwar disturbances, and wanted to see them prosper again. But he also believed that stabilization abroad was in the interest of the United States. For one thing, it was necessary to end gold flows to the United States. Time and again he warned that the only way to stop these inflows and to avoid the danger of gold inflation at home was to help put other countries back on gold standards. Moreover, foreign trade of the United States would benefit. This was partly because stabilization within foreign countries would raise their real incomes and their demands for imports, and partly because stability of exchange rates would promote trade.

Federal Reserve assistance in the restoration and maintenance of gold standards abroad was of several types. For one thing, the Federal Reserve extended stabilization credits to foreign central banks. When a nation had formulated an over-all stabilization program that appeared to be appropriate, the Federal Reserve would extend a credit—a commitment

TABLE 20–3. Credits Extended to Foreign Central Banks by Federal Reserve Banks[a]

Date	Bank Receiving Credit	Amount
1925	Bank of England	$200,000,000
1925	Banking Office of the Ministry of Finance of Czechoslovakia (approx.)	5,000,000
1925	Bank of Poland	10,000,000
1925	National Bank of Belgium	10,000,000
1927	Bank of Poland	5,250,000
1927	Bank of Italy	15,000,000
1929	Bank of Roumania	4,500,000
1929	National Bank of Hungary	2,000,000
1931	National Bank of Austria	1,083,000
1931	National Bank of Hungary	5,000,000
1931	German Reichsbank	25,000,000
1931	Bank of England	125,000,000

[a] For a comprehensive study of these credits, see A. Goldstein, "Federal Reserve Aid to Foreign Central Banks," *Review of Economic Studies*, February, 1935, pp. 79–98.

to lend gold or dollars—to its central bank. The Federal Reserve acted alone in extending a $200 million line of credit to the Bank of England when Great Britain returned to gold in April, 1925. In most of the later stabilizations, it acted in cooperation with other central banks, sometimes as many as 12 or 13 of them. These central-bank credits often served useful purposes even when they were not drawn upon. For one thing, they created confidence in the ability of the central bank to maintain gold payments, thereby discouraging speculative withdrawals from

the country, and, in some cases, even inducing an inflow of funds. These credits also assisted countries in securing foreign loans. In most of the stabilizations, foreign central-bank credits to the nation's central bank were supplemented by private loans to the nation's government. These private loans might not have been made available in the absence of the central-bank credits and the implied approval of the nation's stabilization program by foreign central bankers. Federal Reserve officials and other central bankers, especially Governor Montagu Norman of the Bank of England, often performed useful services in helping countries formulate and gain acceptance of stabilization programs.

On some occasions the Federal Reserve also made funds available to countries after they had returned to gold. It did this by making outright loans or by purchasing claims against the nation's currency in the foreign-exchange market.

Of more interest to us at this point is the extent to which the objective of promoting the restoration and maintenance of gold standards abroad influenced the general monetary policies of the Federal Reserve. In the 1920s, and especially after 1923, this objective made for easier, or at least for less restrictive, general credit policies. Easier credit policies in the United States could, in two principal ways, help other countries to gain or retain gold and international reserves, and to follow more liberal or less restrictive policies at home:

1. By raising United States national money income and price levels; this would increase United States imports and payments of gold and dollars to other countries while discouraging foreign purchases in the United States.

2. By discouraging flows of capital funds to the United States, and by encouraging capital flows out of the United States; this applies to both short- and long-term funds. We shall see later that, after the restoration of gold standards, there was a great volume of short-term funds that proved to be highly sensitive to differentials between interest rates in the principal international financial centers, and especially between New York and London. When London was having difficulty in attracting and holding enough gold to maintain gold payments without an excessively restrictive monetary policy at home, Governor Strong and Governor Norman agreed that, to the extent possible without undue sacrifice of other objectives, they should try to keep interest rates in New York below those in London. This would have a double effect, they hoped. In the first place, it would shunt short-term international funds away from New York and toward London. In the second place, it would divert some part of the world's long-term borrowing away from London and

toward New York. This would militate against a further concentration of gold in New York, lessen payments from Great Britain, and give the rest of the world access to a larger supply of gold and dollars.

The objective of helping other countries undoubtedly made for an easier monetary policy in the United States, especially after 1923. One outstanding case was in 1924, when an aggressive easy-money policy, the first in the history of the Federal Reserve, was undertaken both to combat recession at home and to stimulate capital outflows. Another was in 1927 when the System again initiated an aggressive easy-money policy to combat recession, to stimulate foreign lending, and to repel short-term funds from New York. On still other occasions, Federal Reserve policies were probably easier or less restrictive than they would have been in the absence of this objective. Yet, Governor Strong and other Federal Reserve officials insisted that they would not sacrifice their domestic objectives to promote international cooperation. For example, Strong rejected summarily a foreign suggestion that the Federal Reserve should deliberately induce price inflation in the United States in order to expel gold, increase the international reserves of other countries, and enable them to follow more liberal monetary policies. He would not, he asserted, sacrifice his objective of promoting stable price levels at home. He also warned his colleagues abroad that the Federal Reserve would tighten credit, despite the unfortunate international effects of such a policy, if faced at home by commodity price inflation or excessive stock-market speculation. The latter did occur in 1928 and 1929 and led to a restrictive Federal Reserve policy that injured other countries both by attracting large volumes of short-term funds to New York and by decreasing long-term lending of the United States abroad.

By 1927 the process of restoring gold standards was largely completed, though a few stragglers joined during the next two years. But the new gold standards differed in both form and functioning from those of the prewar period. For one thing, gold-coin standards had largely disappeared except in the United States. Most of the major countries adopted gold-bullion standards to economize gold. Also, gold-exchange standards became far more important than they had been before the war. A large number of the smaller countries adopted pure gold-exchange standards. Several of the larger countries also went on some type of mixed gold-exchange standard, holding a part of their international reserves in gold and a part in the form of claims against some other nation's money. For example, the Bank of France held both gold reserves and very large claims against New York and London. This great growth of gold-exchange standards and of the practice of holding international reserves in

the form of claims against foreign financial centers was a major reason for the presence of a huge volume of short-term international funds highly sensitive to interest-rate differentials. Moreover, the world now had two important financial-center countries. Before the war, London was the one great monetary and financial center, and so was not likely to suffer large net withdrawals of funds. Now it had to share the position with New York.

These developments increased the vulnerability of center countries. The countries that held great volumes of claims against these centers might demand payment in gold, thereby putting the center countries under deflationary pressure and even forcing them to suspend gold payments. Also, the presence of more than one important monetary center made possible large shifts of funds that could embarrass the country losing the funds and perhaps also the country receiving them. For example, a highly restrictive policy in the United States might raise interest rates in New York and attract a large inflow of funds from London, thereby putting Britain under deflationary pressure and also defeating, at least in part, the efforts of the Federal Reserve to reduce the total supply of credit.

The new standards were more highly managed than the old ones. After years of freedom from the discipline of gold, central banks were less willing to follow the old rules of the gold-standard game and to initiate more restrictive policies when they lost gold and more expansionary policies when they gained gold. "Offsetting" and "sterilizing" actions became far more common than they had been before the war. This meant, of course, that the process of equilibrating international receipts and payments was inhibited, as was also the redistribution of gold. For example, the refusal of France to allow her money supply to increase in response to very large gold imports permitted gold inflows to continue at the expense of other countries. Also, the reluctance of countries to permit gold exports to restrict their supply of money and credit made the processes of terminating gold outflows and protecting their supply of international reserves ineffective, or at least sluggish.

The new, international gold-standard system was also characterized by disequilibrium relationships among the various national price levels as stated in terms of gold. In the prewar period, these price-level relationships were pretty well equilibrated. But many of the countries returned to gold on terms that either "undervalued" or "overvalued" their currencies in relation to those of other countries. For example, France almost certainly undervalued the franc in foreign-exchange markets when she stabilized it in 1926. She gave it a gold value equivalent to 3.92

cents, as against 19.3 cents in the prewar period. But this low exchange rate of the franc together with the price level within France made that country a cheap country in which to buy and an unattractive one in which to sell, so that her receipts exceeded her international payments on trade account. Her refusal to allow her gains of international reserves to raise her domestic price level permitted this excess of receipts to continue. On the other hand, Great Britain almost certainly returned to gold on terms that made her domestic price level in terms of gold "too high." The pound sterling was given its prewar gold content, so that the exchange rate on the pound hovered around $4.8665. But the British domestic price and cost levels had not been reduced enough to make Britain an attractive market in which to buy when each pound cost about $4.8665. As a result, British export industries did not thrive. A reduction of British wage rates and other costs of production would have stimulated her export industries, but her cost structure had become inflexible downward. The functioning of the new gold standards suffered from these disequilibrium relationships among national price levels.

We shall see later that several of these aspects of the new gold standards contributed to their breakdown in the 1930s: the widespread use of gold-exchange standards, the large volume of international short-term funds highly sensitive to interest rate differentials and to shifts of confidence in foreign currencies, disequilibrium relationships among the various national price levels, and the reluctance of countries to follow the old rules of the gold-standard game to equilibrate their balances of payments.

Summary

By 1922, Federal Reserve officials realized that the old rules of the gold-standard game were obsolete, and that new objectives and guides would have to be developed. Within the next two years, they had developed three principal sets of considerations that guided their policies during the next decade: promotion of price-level stability and high and stable levels of business activity, prevention of an excessive use of credit for speculation, and promotion of the restoration and maintenance of gold standards abroad.

DEVELOPMENT OF FEDERAL RESERVE INSTRUMENTS

While the Federal Reserve was developing new policy objectives and guides in the 1922 to 1924 period, it was also making remarkable progress in developing its instruments of control. The outstanding event of the period was the discovery and development of open-market operations in

United States government securities. Never, before 1922, had the Federal Reserve bought or sold these securities for monetary management purposes. The relatively small purchases and sales that had occurred were for such purposes as to provide earnings for the Reserve banks, to retire some national bank notes, and to assist the Treasury. Moreover, they were made by the individual Reserve banks without any sort of centralized coordination. Two very important events occurred in 1922 and 1923. In the first place, the Federal Reserve discovered how these operations might be used for monetary management purposes. In the second place, the execution of these operations was centralized in a System committee. After the discovery and development of this device, the Federal Reserve had three principal instruments: discount rates, open-market operations in acceptances, and open-market operations in United States government securities.

Within a short time, the Federal Reserve was using open-market operations in government securities for both defensive and dynamic purposes. This was an excellent defensive weapon with which to offset or to sterilize the effects of gold inflows and outflows. It was also used to offset net cash inflows or outflows domestically and also large net Treasury receipts or expenditures. For dynamic purposes, it proved to be extremely useful, for the Federal Reserve could itself determine both the timing and amount of its purchases and sales. The following pattern of dynamic operations soon developed: If the Federal Reserve wished to restrict credit, it led off with sales of government securities. This reduced the volume of any excess reserves that previously existed and forced banks to borrow more heavily to repair their reserve positions. This in itself restricted credit somewhat and raised market rates of interest. The Federal Reserve would then decide whether and to what extent it would intensify restrictive pressures by raising its discount rates and its buying rate on acceptances. When it wished to initiate easier credit conditions, it usually led off by purchasing government securities, which gave some banks excess reserves and enabled others to repay some of their borrowings at the Reserve banks. This directly eased credit somewhat and reduced market rates of interest. If the System wished to intensify the ease, it then reduced its discount rates and acceptance-buying rates.

FEDERAL RESERVE POLICIES, 1923 TO 1929

Having discussed both its objectives and its development of instruments for regulation, let us now look briefly at some of the principal episodes in Federal Reserve policy after the end of the postwar depression.

By 1923, the economy was well on its way to recovery, and prices were rising slowly. The Federal Reserve therefore initiated a mildly restrictive policy. It sold more than enough government securities to offset the $250 million net increase of the monetary gold stock, thereby forcing member banks to increase their borrowing somewhat. Market rates of interest rose slightly, and the Federal Reserve raised its discount rates—the New York rate going from 4 to 4½ percent.

Easy Money, 1924

In 1924, the Federal Reserve initiated its first peacetime aggressive easy-money policy. In the early months of the year, it moved cautiously to lessen the degree of restraint that had existed in late 1923, when member banks had owed the Federal Reserve about $800 million. In May, it began to act more vigorously. In all, it raised its holdings of government securities from $118 million to $488 million, or a net increase of $370 million. These purchases, together with continued gold inflows, enabled member banks to reduce their borrowings to less than $300 million. As market rates of interest fell, the Reserve banks lowered their discount rates. The New York Bank reduced its rate from 4½ to 4, then to 3½, and finally to 3 percent. Money-market conditions became the easiest they had been at any time since the war.

This easy-money policy was initiated for both domestic and international reasons. A recession seemed to be starting; agriculture was still depressed in many areas, industrial production showed a downward drift, and wholesale prices declined about 3 percent during the first half of the year. If the recession was not serious enough to require an aggressive easy-money policy, it at least seemed to permit such a policy to be followed without adverse effects. The other major objective of the policy was to promote United States lending abroad, and to create conditions that would hasten the restoration of gold standards and end the unwanted flow of gold to the United States. Governor Strong welcomed this opportunity to bring interest rates in New York below those in London. He had reason to think that conditions had now become such that his international objectives might soon be achieved. For one thing, the Dawes Plan for the temporary settlement of the controversial reparations question had created a more favorable atmosphere for international lending. For another, it appeared that England might soon return to gold if favorable conditions could be created.

The easy-money policy probably contributed to the rapid recovery of business activity during the latter half of 1924. It certainly increased United States lending abroad. Aided by both easy-money conditions and

the improvement of international conditions, United States loans to other countries in the latter half of 1924 were far above their level in previous years. The larger outflow of United States dollars, and perhaps also the diversion of international borrowing away from London, tended to raise the exchange rate on sterling. At the beginning of the year it had been \$4.25; by the end of the year it was \$4.70, only 3 percent below its prewar parity. Soon thereafter Britain began to make plans for her return to gold. It is also significant that the flow of gold to the United States was stopped in 1924, and was not resumed until three years later. This easy-money policy may also have contributed, as some of its critics allege, to the subsequent growth of stock-market speculation.

Relative Calm, 1925 to 1926

The objective of promoting the restoration and maintenance of gold standards abroad counseled a relative easy-money policy during this period. Several countries had returned to gold standards with Britain; others soon followed. Continued large United States lending and avoidance of flows of funds to New York were desirable not only to help additional countries return to gold, but also to enable countries that had already returned to maintain their international reserves without excessively restrictive monetary policies. Nor did the objective of preventing commodity price increases call for very restrictive policies. After recovering in late 1924 and the first few months of 1925, wholesale prices drifted slightly downward during the remainder of the decade. But stock speculation began to threaten. Recovery from the 1924 recession and rising stockmarket activity evoked a more restrictive policy in early 1925. The System sold about \$250 million of government securities and raised its discount rates, the New York rate going from 3 to 3½ percent. As speculation continued to grow, the New York Bank raised its rate to 4 percent at the beginning of 1926. This rate was reduced to 3½ percent in April, 1926, as speculative activity subsided, but was restored to 4 percent in August when stock-market activity again surged upward. Speculation had already become a problem, but the worst was yet to come.

Easy Money Again, 1927

The Federal Reserve's second, aggressive easy-money policy also had both domestic and international objectives. A recession in domestic economic activity again threatened, and wholesale prices began to fall slowly early in 1927. At least as important to the policy-makers, several foreign countries were losing international reserves, or could maintain them only by adopting more restrictive monetary policies. The rise of

interest rates in New York accompanying the more restrictive Federal Reserve policy in the latter part of 1926 was tending to attract funds from abroad and to restrict United States foreign lending. Gold inflows, which virtually had been halted since 1924, were resuming. Federal Reserve officials feared that these developments would not only injure other countries, and especially Britain, but would also renew the flow of gold to the United States and reduce the foreign demand for United States exports, especially for agricultural products. The situation was further complicated by conflicts between the Bank of France and the Bank of England. France finally succeeded in achieving a de facto stabilization of the franc in late 1926. This was accompanied by a rapid repatriation of funds that private French holders had formerly held abroad, and especially in the form of claims against London. When the Bank of France bought these claims, it acquired the power to drain very large amounts of gold from London. In the midst of a controversy with the Bank of England, it withdrew some gold and threatened to withdraw more if the Old Lady of Threadneedle Street did not conform its policies to the wishes of the Bank of France. It was to discuss these and other matters relating to international conditions that Governor Strong invited representatives of the Bank of England, the Bank of France, and the German Reichsbank to meet with him in early July, 1927.

The easy-money policy of 1927 was initiated late in July after this meeting, though not solely because of it or of the issues discussed there. The Federal Reserve purchased about \$300 million of government securities and lowered discount rates from 4 to 3½ percent. These actions were accompanied by an easing of money-market conditions. This easy-money policy probably contributed to the recovery of business activity in the latter half of 1927 and it clearly was effective for international purposes. The inflow of foreign funds was decreased, and American foreign lending maintained. The inflow of gold was reversed; within the next year about \$500 million of gold flowed out. Most European central banks were able to get through the year without adopting more restrictive policies. Again, however, the easy-money policy may have encouraged stock speculation.

The Stock Market, 1928 to 1929

From the beginning of 1928 until after the great crash in October, 1929, the objective of preventing an undue use of credit for stock-market speculation virtually dominated Federal Reserve policy. The objective of promoting stability of prices and business activity justified the first move toward credit restriction in early 1928. But neither this objective

nor that of promoting the maintenance of viable conditions abroad was responsible for the degree of restriction achieved by 1929. Between the end of 1927 and mid-1929, the Federal Reserve sold about $450 million of government securities. On the latter date, it had only $147 million left. To maintain their reserve positions during the latter part of 1928 and the first nine months of 1929, member banks had to go into debt to the Federal Reserve by about $1 billion. This was by far the largest volume of member-bank borrowings since 1921. All the Reserve banks raised their discount rates several times. Starting at 3½ percent in 1927, the New York Bank rate was raised to 4 percent in February, 1928, to 4½ percent in May, to 5 percent in July, and then, a year later, to 6 percent in August, 1929. Market rates of interest, both short- and long-term, rose markedly. The rate applicable to call loans on the stock exchange was especially volatile. In late 1928, it was often above 8 percent, sometimes considerably above this level. In 1929, it ranged even higher. This rate became very important, partly because it was the rate to which short-term international funds responded.

TABLE 20–4. Indexes of Common Stock Prices
1935–1939 = 100

Period	Total	Industrial	Railroad	Public Utility
1913	71	40	240	90
1921	58	47	164	68
1924	77	63	204	92
1925	95	80	238	111
1926	106	90	265	117
June, 1927	122	103	316	135
Dec., 1927	141	122	336	149
June, 1928	153	134	336	173
Sept., 1929	238	195	446	375
1st half of 1930	175	141	364	276
June, 1932	36	30	38	64

SOURCE: Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics*, 1943, pp. 479–481. These indexes are those of Standard and Poor's Corporation.

Federal Reserve officials faced many perplexing questions as they tried to evaluate the behavior of the stock market, and to formulate their policies relative to it. One of these cannot yet be answered satisfactorily: "What would constitute a reasonable level of stock prices, assuming continued prosperity and continuing economic growth?" It has since become fashionable to laugh at those who defended as reasonable the highest levels reached in 1929. But no less silly were those who began to

predict a crash as soon as stock prices began to rise above their depressed levels in 1921—levels that were below those of the prewar period. Even now we cannot be sure that the levels reached by June, 1928, would have proved unreasonable if prosperity had continued. It is important to note that, between mid-1928 and September, 1929, stock prices rose more than they had during the preceding four years. Moreover, after the crash, they quickly regained half their losses and during the first half of 1930 averaged above their mid-1928 level. Only as the country slid into depression and despair did stock prices fall so low as to make those of mid-1928 look absurdly high. But these were absurdly low, assuming any chance of business recovery.

Federal Reserve officials always insisted that their chief concern was not with the level of stock prices, but with the use of credit for speculative purposes. They therefore faced the perplexing question of determining the boundary line between "reasonable" and "unreasonable" amounts for this purpose. The volume of credit used to purchase and to carry stocks certainly increased markedly during this period. Much of this credit was not borrowed through brokers. But Table 20–5 shows that

TABLE 20–5. Loans to Brokers
(amounts in millions)

Date	Total	By New York City Banks	By Outside Banks	By Others
Dec. 31, 1924	$2,230	$1,150	$ 530	$ 550
Dec. 31, 1925	3,550	1,450	1,050	1,050
Dec. 31, 1926	3,290	1,160	830	1,300
Dec. 31, 1927	4,430	1,550	1,050	1,830
June 30, 1928	4,900	1,080	960	2,860
Dec. 31, 1928	6,440	1,640	915	3,885
Oct. 4, 1929	8,525	1,095	790	6,640
Dec. 31, 1929	4,110	1,200	460	2,450

SOURCE: Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics*, 1943, p. 494.

loans to brokers nearly quadrupled after 1924, rising to $8.5 billion on the eve of the crash. The sources of these loans should be noted. Taken as a group, commercial banks did not increase their loans of this type. Other lenders accounted for all the increase; on the eve of the crash, they were supplying two-thirds of all these loans. These other lenders, attracted by very high call-loan rates, were of many types. They included not only individuals and financial intermediaries, but also nonfinancial

corporations and foreign lenders. The flow of funds from foreign centers was very embarrassing to several central banks.

Federal Reserve officials were perplexed as to how to limit the supply of credit for stock speculation. They did not then have the legal power to impose margin requirements—the power that has since proved effective in limiting the volume of credit used for this purpose without curtailing the supply and raising the cost of credit for other purposes. Nevertheless, the Federal Reserve Board tried, early in 1929, to achieve this result by applying "direct action" to banks that were in debt to their Federal Reserve banks. Through its own pronouncements and through the various Reserve banks, it informed members that they should not make loans on stocks for speculative purposes while borrowing at the Federal Reserve. This device failed to get a fair trial because several of the Reserve banks did not favor its use, at least not in the absence of further increases in discount rates. Nevertheless, it is highly unlikely that this type of direct action could have succeeded in curtailing loans on stocks without at the same time curtailing the supply and raising the cost of credit for other uses. It applied only to banks that were currently in debt to the Federal Reserve. These banks probably accounted for only a small part of this type of credit, and some of them would have curtailed their loans for other purposes in order to repay the Federal Reserve rather than call their highly lucrative stock-market loans. It did not reach nonborrowing banks, and certainly not the various types of other lenders who rushed in to lend more, probably at the expense of other types of lending or spending, as call-loan rates rose.

Lacking any effective type of selective control, the Federal Reserve tried to regulate the situation through general credit restriction. It hoped that restrictive policies could kill the speculative fever and reduce the demand for speculative loans quickly, so that easier policies could then be instituted. Unfortunately, "legitimate business" and the international situation proved to be more vulnerable than the stock market.

These restrictive credit policies had almost no adverse effect on the international situation during the first half of 1928. United States foreign lending continued at a high level, and gold continued to flow out of the country. But the tide began to turn in the latter part of 1928, as credit conditions became tighter. The rate of foreign flotations in the United States market in the latter half of 1928 and the first half of 1929 was only 65 percent of that in 1927; in the latter half of 1929 it was less than a third of that in 1927. Moreover, large amounts of funds flowed from abroad to New York, some to buy stock, more to take advantage of the high interest rates attainable there. These developments forced

several European central banks to sell large amounts of their foreign-exchange holdings and ship gold to support their currencies. More than $260 million of gold flowed to the United States between mid-1928 and October, 1929. Many foreign central banks were impelled to raise their discount rates and to adopt generally more restrictive policies in order to protect their reserve positions.

By mid-1929, the domestic business situation had begun to deteriorate. This was perhaps in part because the marginal efficiency of investment had been shifted downward by the large net accumulations of capital during the protracted investment boom. But it was at least aggravated, if not initiated, by the high cost of loanable funds, both short- and long-term.

The rest of this story is now well known history. After several weeks of vacillation, the stock market crashed in October, 1929. With it crashed the "new era." The problems of the next decade were not to be those of excessive bullishness.

21. Monetary Policy in the Depression, 1930 to 1941

At the time of the stock-market crash, and even in 1930, no one could foresee that the depression into which the world was sliding would be the most devastating in its entire history and would be a major contribution to political and economic upheavals and even to the outbreak of a second world war. This depression lasted more than a decade and came to an end only in World War II. At its depth in the United States, national money income had fallen 50 percent, and real output and income, 25 percent. One worker out of four was without a job and many others were working only part time. Business firms failed by the tens of thousands, farmers lost their farms, and families their homes. Amidst falling incomes and price levels, the monetary and financial system virtually collapsed. The gold-standard system that had been so laboriously reconstructed in the latter half of the 1920s had largely disappeared by 1932. The United States banking system, weakened earlier, collapsed in 1933. Many other financial institutions closed their doors, or at least ceased to function effectively in the saving-investment process. International lending came to a standstill. The whole complex of war debt and reparations obligations, which had been such disturbing issues in the 1920s, was largely repudiated. It is hardly surprising that under such circumstances monetary policies became unorthodox.

UNITED STATES MONETARY POLICIES, 1930 TO 1931

There was little that was novel in United States monetary policies from the time of the crash in October, 1929, until the autumn of 1931.

The government did not enter the field, and Federal Reserve policies followed the general patterns of 1924 and 1927. The Federal Reserve began to relax its restrictive policy and to ease credit almost immediately after the crash. By the end of the year, it had increased its holdings of government securities about $300 million, and had reduced its discount rates. The New York rate was first reduced from 6 to 5 and then to 4½ percent.

Policies during 1930 and the first eight months of 1931 followed the same pattern. The system gradually added another $250 million to its holdings of government securities. By August, 1931, these stood at about $700 million, or $550 million above their level at the time of the crash. Largely because of these purchases and a net gold inflow of about $600 million, member banks were enabled to reduce their borrowings from about $1 billion to about $200 million while maintaining approximately constant the dollar volume of their reserves. Discount rates were reduced several times. In six steps the New York bank lowered its rate from 4½ percent at the beginning of 1930 to 1½ percent in May, 1931. Rate reductions at the other Reserve banks were smaller.

Federal Reserve policies during this early period have been criticized as too slow and too timid. Critics point out that even as late as August, 1931, member banks still owed the Federal Reserve about $200 million and had excess reserves of only about $120 million. They believe that the Federal Reserve should have purchased a much larger volume of government securities and acceptances to enable member banks to repay all their borrowings and to accumulate several hundred millions of excess reserves. This criticism is well justified.

Starting about September, 1931, the Federal Reserve allowed credit conditions to tighten significantly, and these tighter credit conditions persisted for several months. Two major developments were responsible for this. One was an upsurge of bank failures that damaged confidence in banks and induced large withdrawals of cash from the banking system. These began in 1930. Prior to that time, cash had been flowing into the banking system, reflecting decreased needs for currency in circulation as payrolls and retail trade declined. By October, 1931, the volume of coin and currency outside the banking system was about $1 billion larger than it had been in mid-1930. Still more cash drains occurred in early 1933. The other major event leading to tighter monetary conditions in the United States in the last part of 1931 was the breakdown of the international gold standard.

THE BREAKDOWN OF GOLD STANDARDS

Four South American countries had suspended gold payments by the end of 1930. Twenty-three others, including Great Britain, abandoned gold in 1931. By the end of 1936, practically all countries had either left gold or had modified their old gold standards in fundamental respects.

What brought about this worldwide breakdown of gold standards? One basic factor was the devastating decline of real incomes and price levels, which decreased demands for exports and lowered the foreign-exchange earnings of exporting countries. Especially hard hit were countries that relied heavily on exports of raw materials whose prices dropped sharply. With great decreases in their export earnings, they found it difficult to reduce their international payments correspondingly and to protect their gold and other international reserves.

A second basic factor was the virtual cessation of international lending. During the latter part of the 1920s, many countries had come to rely heavily on foreign borrowings to meet their international payments and protect their international reserves. United States net lending abroad was over $700 million in 1926, over $1000 million in 1927, and about $850 million in 1928. In 1929, largely because of tight money conditions, these loans shrank below $300 million. Such lending practically disappeared as the depression deepened, the prospects of repayment darkened, and some foreign debtors began to default on their outstanding obligations. During 1931 to 1932, repayments to the United States actually exceeded her new foreign lending by nearly $500 million. Many countries could not bear the strain of losing their receipts from foreign borrowings and of making net payments of interest and principal at a time when their receipts for exports were falling.

A third factor was the presence of a huge volume of short-term international debt. We have already seen that the widespread use of gold-exchange standards involved very large foreign holdings of claims against financial centers, such as London and New York. Moreover, many countries, such as Austria, had borrowed heavily abroad on short term. All of these debts were payable on demand or on short notice. And foreign creditors were likely to demand payment the moment they came to fear that the debtors could not pay or that the debtor's currency would depreciate in terms of gold. In its first manifestation the international panic was an international banking panic.

The international panic began in May, 1931, with the failure of the Credit-Anstalt, the largest bank in Austria. This raised doubts as to the ability of any Austrian bank to meet its obligations, and not only for-

eigners but many Austrians as well withdrew large amounts of funds from the country. So great was the flood of withdrawals that it exhausted large loans from the Bank of England and the Bank for International Settlements as well as Austrian holdings of gold and foreign money; consequently Austria was forced to terminate the convertibility of her money in gold. Many creditors found their remaining credits frozen and depreciating in terms of gold.

The panic was now on. Fearful creditors, remembering losses in Austria, began to withdraw their credits from Berlin, and frightened Germans joined the run. Within a few weeks and despite sizable loans from the Bank of England, the Bank of France, the Bank for International Settlements, and the Federal Reserve Bank of New York, Germany suspended gold payments in July, 1931, and placed strict limitations on international payments of all sorts. Millions of dollars' worth of short-term foreign credits were frozen in Germany.

Reinforced, the panic swept on to London, from which credits were rapidly withdrawn. An increase in its discount rate by the Bank of England, which was supposed to attract and retain foreign funds, seemed rather to publicize the fact that England was in financial difficulties, and thereby hastened withdrawals. Even a $250-million joint credit from the Federal Reserve Bank of New York and the Bank of France was insufficient to stop the run or to cover withdrawals, which amounted to $975 million from July to late September. England departed from gold on September 21, 1931. The retreat from gold now became a rout. By April of 1932, gold standards had become inoperative in the following countries:[1]

Argentina	Estonia	Nicaragua
Australia	Finland	Norway
Austria	Germany	Paraguay
Bolivia	Greece	Portugal
Brazil	Honduras	Rhodesia
Bulgaria	Hungary	Russia
Canada	India	Salvador
Chile	Iraq	Spain
Colombia	Irish Free State	Sweden
Costa Rica	Japan	Turkey
Czechoslovakia	Jugoslavia	United Kingdom and dependencies
Denmark	Latvia	
Ecuador	Newfoundland	Uruguay
Egypt	New Zealand	Venezuela

This dramatic breakdown of the international gold standard affected monetary and economic conditions in the United States in at least two

[1] H. V. Hodson, *Slump and Recovery, 1929–1937*, London, Oxford, 1938, p. 92.

ways. In the first place, as we shall see later, it evoked large gold withdrawals from this country. In the second place, it tended to decrease the demand for United States exports and to lower their dollar prices. Most foreign currencies depreciated in terms of gold and in terms of dollars after their countries left gold standards. As shown in Table 21–1, most

TABLE 21–1. Decline of Selected Foreign-Exchange Rates, 1929–February, 1933[a]

Money	Average Price in Dollars in 1929	Average Price in Dollars in February, 1933	Percentage Decline of Money in Terms of Dollars
British pound	$4.857	$3.422	30
Canadian dollar	0.992	0.835	16
Argentine peso	0.951	0.586	38
Brazilian milreis	0.118	0.076	35
Indian rupee	0.362	0.258	29
Chilean peso	0.121	0.060	50
Danish krone	0.267	0.153	43
Norwegian krone	0.267	0.175	34
Swedish krona	0.268	0.183	32
Portuguese escudo	0.045	0.031	31
Australian pound	4.81	2.72	45

[a] This table deliberately omits money that was inconvertible in terms of gold and which was artificially pegged, at least in official markets, at high prices. Most of these moneys were depreciated in unofficial or black markets.

foreign currencies had depreciated at least 30 percent in terms of the dollar by early 1933. As foreign buyers saw it, the dollar had become much more expensive in terms of their own currencies. They would therefore buy fewer United States products unless the dollar prices of these products fell enough to offset the rise in the price of the dollar in the foreign-exchange market. Thus, the depreciation of foreign currencies tended to depress United States export industries, including agriculture. Also, by making foreign products cheaper in terms of dollars, it tended to stimulate United States imports, which did not please some of those in import-competing industries. Many observed that this was what the world needed to bring international balances of payments into equilibrium and end the excess of United States exports over her imports. But such international objectives were not prized highly by a nation in the midst of depression. One of the major objectives of the United States policy of lowering the gold content of the dollar in 1933 to 1934 was to lower the exchange rate on the dollar, thereby tending to increase United States exports and to raise their dollar prices, and also to discourage imports and help import-competing industries.

UNITED STATES MONETARY POLICY, SEPTEMBER, 1931 TO MARCH, 1933

Let us now return to United States monetary policies during the period from Britain's suspension of her gold standard to the breakdown of the United States banking system in March, 1933.

Tighter Money, September, 1931 to February, 1932

Almost as soon as Britain suspended gold payments, foreign demands for gold shifted to the United States. Gold losses were $250 million in September and $450 million in October. The restrictive effects of these gold outflows were reinforced by an upsurge of cash withdrawals from the banking system. Between August, 1931, and February, 1932, these net drains were almost $700 million. The Federal Reserve did not buy securities to offset these external and internal drains. As a result, member banks had to increase their borrowings by more than $600 million, and consequently suffered a $440 million net reduction in their reserves. Most of the Reserve banks raised their discount rates. The New York rate rose from 1½ to 2½ percent and then to 3½ percent. Market rates of interest rose, and credit became less available.

Why did Federal Reserve officials refuse to buy securities in the open market to offset these drains, and why did it actually raise discount rates in the face of a continuing and even accelerating decline of business and employment? Perhaps one reason was their fear that gold drains would become larger and prolonged. Another was that their gold position was precarious. The problem was not with the ratio of their gold reserves to their Federal Reserve note and deposit liabilities; this was comfortably above its legal minimum. Rather, their problem was created by a provision in the Federal Reserve Act, requiring that Federal Reserve notes be collateraled dollar for dollar, and that the only assets eligible to serve as collateral were gold and commercial paper discounted by borrowing member banks. As member-bank borrowings decined and reduced Federal Reserve holdings of commercial paper, more gold had to be used as collateral. To the extent that Federal Reserve purchases of government securities enabled member banks to reduce their borrowings, the problem was intensified. At one time the volume of "free gold" was only $500 million. This impasse was finally broken in February, 1932, when Congress passed the Glass-Steagall Act permitting the Federal Reserve banks to use government securities as collateral for Federal Reserve notes. The Federal Reserve began almost immediately thereafter to purchase government securities.

Easy Money, March, 1932 to Early 1933

Early in March, 1932, the Federal Reserve embarked upon a program of purchasing government securities that was by far the largest in its history up to that time. At the end of February, its holdings of these securities were \$740 million; at the end of the year they were \$1855 million, an increase of \$1115 million. These purchases permitted member banks to reduce their borrowings by about \$600 million and to increase their reserve balances by \$500 million. At the end of the year they had more than \$550 million in excess reserves. The New York Bank reduced its discount rate from 3½ to 3 percent and then to 2½ percent. Most of the others left their rates unchanged at 3½ percent throughout the year. Market rates of interest declined again, but many banks were, by this time, in no shape to increase the availability of credit.

Banking Panic of 1933

At the end of 1932 there was some reason to hope that monetary and financial conditions in the United States had been improved and would continue to improve. The banks had over half a billion in excess reserves, gold outflows appeared to have ended, and cash withdrawals from the banking system had recently slowed down. But the solvency and liquidity of individuals, business, and financial institutions had been seriously undermined by the prolonged and serious declines of real incomes and of the prices of output and assets. Many borrowers were in no position to pay their debts promptly, if at all. Thousands of banks were therefore illiquid, if not insolvent. Any sharp jar to confidence could topple the entire structure. The storm broke in Detroit with the failure of the Union Guardian Trust Company, which was one of the largest banks in Michigan and was also closely connected with many other banks. So great was the blow to public confidence and so panicky were withdrawals from other banks that the governor of Michigan on February 14, 1933, declared an eight-day banking holiday. The panic quickly spread to other states. By March 4, every state in the Union had declared bank holidays, and bank deposits were no longer redeemable in cash. President Roosevelt's decree of a four-day, nation-wide banking holiday, beginning on March 6, merely recognized the existing situation.

The panic period was characterized by gold and currency withdrawals. The country's monetary gold stock declined about \$250 million. Net cash withdrawals from the banking system were nearly \$2 billion, and would, of course, have been larger if banks had not closed their doors so soon. These drains forced member banks to increase their bor-

rowings at the Federal Reserve by $1.2 billion and to reduce member-bank reserves by more than $800 million.

From the closing of the banking system in March, 1933, until the end of the decade, the relative role of the Federal Reserve in United States monetary policy was less than it had been earlier. The government now entered the field and acted vigorously and sweepingly, if not always wisely. Moreover, as a consequence of its policies and of developments abroad, the banking system was, within a few years, so amply supplied with excess reserves as to be largely beyond control by the Federal Reserve.

THE NEW DEAL AND MONETARY POLICY

One of the first projects of President Roosevelt and his administration after they assumed office on March 4, 1933, was that of reactivating a closed banking system. But their actions went far beyond this. Within a short time, they had suspended the gold standard, depreciated the dollar in gold, established a new and quite different type of gold standard, provided for the monetization of great amounts of silver, and established many new financial institutions.

Reopening the Banks

The objective was to reopen the banks and to do so in such a way as to restore confidence in their solvency and liquidity, to prevent further cash withdrawals, to encourage cash to flow back into the system, and to enable the banks to resume their lending function. The first step was to discover the condition of the banks. All supervisory authorities quickly surveyed the banks and divided them into three classes. Those that were in good condition were permitted to reopen quickly. Those that were in hopeless condition were closed permanently. The middle group of banks that were not sound enough to open immediately but that were capable of being saved, were given help and allowed to open when their condition had been repaired. Most of this help came from the Reconstruction Finance Corporation, a government credit agency that had been established in 1932. A temporary deposit-insurance program was instituted to restore confidence in the safety of deposits.

The public responded remarkably well. By the end of March, $1.2 billion in cash had been redeposited with banks; another $700 million flowed back before the end of the summer. In the latter part of the year, the Federal Reserve provided banks with additional funds by purchasing $600 million in government securities. Largely because of these developments, member banks were able to reduce their debt to the Federal

Reserve from $1.4 billion at the time of the panic to only about $100 million late in the year, and, at the same time, to add $900 million to their reserve balances. Their excess reserves rose to about $800 million. From this level, excess reserves continued to rise, largely because of the surge of gold imports that began in 1934.

Gold Policies

One of President Roosevelt's first official acts was to suspend the gold standard. Gold exports were prohibited; banks and other financial institutions were forbidden to pay out gold domestically; and everyone was ordered to surrender to the Treasury all his holdings of gold and gold certificates. Many thought at first that these were merely temporary measures that would be rescinded as soon as confidence was restored. But the old, gold-coin standard and the old, gold dollar were gone forever.

The prolonged depression and the severe decline of price levels had generated many schools of monetary expansionists similar to those which had been extant during the long deflation which followed the Civil War. Some would settle for more money of any kind, others wanted more of a particular type of money. Some of the more conservative urged a greater expansion of Federal Reserve credit. Vocal groups in the South and West, remembering the battle cries of the late nineteenth century, demanded free coinage of silver at the old 16-to-1 ratio. Others, looking at the current use of "scrip," "prosperity checks," "corn money," and "cotton money" in a number of states, demanded national issues of scrip. Some wanted large issues of greenbacks of the Civil War type. Technocrats wanted a whole new monetary system, using the erg as the unit of account. Still others demanded an increase in the price of gold.

These influences were reflected in legislation enacted in May, 1933, which gave the President unprecedented discretionary powers to expand the money supply in many ways.[2] The President himself, or the Secretary of the Treasury acting under presidential direction, was empowered to:

1. Enter into agreements with the Federal Reserve Board and the Federal Reserve banks for the latter to buy directly from the Treasury, and to hold up to $3 billion of federal government securities in addition to those already in their portfolios.
2. Issue United States notes (greenbacks) in amounts not to exceed $3 billion. These were to be legal tender for all debts.
3. To fix the gold value of the dollar by proclamation, with the limitation that it should not be reduced more than 50 percent.
4. Fix the silver value of the dollar and to provide for the unlimited coinage of

[2] This legislation was included in Title III of the Farm Relief Act approved by the President on May 12, 1933.

both gold and silver at fixed ratios. The President could re-establish a bimetallic standard in this country alone, or he could enter into agreements with other countries to establish international bimetallism.

5. Accept silver at a price not to exceed 50 cents an ounce in payment of debts from foreign governments, the total accepted in this form not to exceed $200 million. Any silver acquired in this way was to be coined into silver dollars and held as backing for additional silver certificates.

The President did not use his discretionary powers to sell government securities directly to the Federal Reserve or to issue greenbacks. He did, however, take massive action with respect to gold and silver.

The dollar began to depreciate in terms of both gold and foreign currencies as soon as President Roosevelt suspended the gold standard. That is, the dollar prices of gold and foreign exchange began to rise. For example, between February and June, 1933, the British pound rose from $3.42 to $4.14, the Canadian dollar from 83.5 to 89.9 cents, and the French franc from 3.92 to 4.80 cents. It soon became evident that exchange rates might behave in a disorderly manner, and that countries might even resort to competitive devaluation, each trying to lower the exchange rate on its own currency relative to others in order to stimulate its exports and discourage imports. To deal with this and other issues, an international monetary conference was held in London in June, 1933. One proposal was that all important countries should enter into an agreement to return to some sort of gold standard. That many other countries would have agreed to this is doubtful. In fact, however, the proposal was killed when President Roosevelt refused, stating that to stabilize the dollar in gold was a far less important objective than that of raising the American price level to promote recovery and then stabilizing it. Soon thereafter he began vigorously to use his power to increase the dollar price of gold. From September 8 to October 24, the Secretary of the Treasury stood ready to buy newly mined domestic gold at a price equal to the best price available in free markets abroad. On October 24, this price was $29.80 per ounce, or 44 percent above the old mint price. Following President Roosevelt's instructions, the Reconstruction Finance Corporation began, on October 25, to buy gold at gradually increasing prices. These month-end prices were:[8]

Date	RFC Purchase Price per Fine Ounce	Percentage of Old Mint Price ($20.67)
October 31, 1933	$32.12	155
November 29, 1933	33.93	164
December 30, 1933	34.06	165
January 31, 1934	34.45	167

[8] See Secretary of the Treasury, *Annual Report, 1934*, p. 205.

Thus, by the end of January, 1934, the price of newly mined domestic gold had been raised 67 percent above the old mint price; the gold value of the dollar had been reduced about 40 percent.

It is clear that the gold-buying program to raise the price of gold was undertaken as part of the general program to raise commodity prices. This was emphasized in the President's October 22 radio address just before the RFC gold-buying program was begun.[4] What is not as clear, however, is the process by which the enhanced price of gold was expected to increase the prices of other goods and services. Some critics have accused the President of accepting fully the rather naïve theories held by one of his monetary advisers, Professor George F. Warren, regarding the relationship between gold and price levels. Professor Warren, pointing to alleged long-run correlations between the monetary value of gold stocks and the height of price levels, argued that an increase in the price of gold would raise domestic price levels in a short period of time and almost in proportion to the increase in the price of gold. With many qualifications, there is some tendency *in the long run* for the monetary value of gold stocks and price levels to move in a parallel manner. Even in the short run, an increase in the price of gold can be used to increase the monetary value of gold stocks and the size of bank reserves, thereby *permitting* an expansion of the money supply. But there is no assurance that the total money supply, being largely composed of bank deposits, will rise proportionally in the short run, or that an increase of the money supply, even if achieved, will increase spendings proportionally, or even that increased spendings will effect proportional changes in price levels. The extent to which the President was influenced by Professor Warren's theory is not known.

It seems likely, however, that a stronger motive for raising the dollar price of gold was the one mentioned earlier: the desire to lower the value of the dollar in terms of foreign money, thereby increasing the foreign demand for our exports, especially for farm products, and raising the prices of these goods in term of dollars. This is indicated in the President's notes for his radio address on October 22, 1933.

> At this point it may be said that the depreciation of foreign currencies, prior to 1933, had had the effect of making the dollar more expensive in terms of those foreign currencies. Thus it took more pounds, more francs or more marks to buy a dollar than it had formerly and, since the prices of our export products are determined in terms of dollars, it took more pounds, francs and marks to buy our export products. The effect of this had been to contribute to the serious decrease in our foreign trade, not because our own prices, in terms of dollars, had risen,

[4] This speech is reproduced in *The Public Papers and Addresses of Franklin D. Roosevelt*, vol. ii, pp. 420–427.

nor because our own products were of an inferior quality, nor because we did not have sufficient products to export. But because, in terms of foreign currencies, our products had become so much more expensive, we were not able to obtain our fair share of the world's trade. It was, therefore, necessary to take measures which would result in bringing the dollar back to the position where a fair amount of foreign currency could again buy our products; that is, to make the dollar cheaper in terms of pounds, francs or marks. This was the process which commenced in March, 1933, and which had to be continued until that level was reached. It was not desirable to make this level too low, because then our own importers would find it difficult to buy foreign merchandise. But it was clear that the level had been too high, and we wanted to find the appropriate level.[5]

Table 21–2 shows the extent to which the increasing dollar price of gold was reflected in rising exchange rates on selected foreign currencies. At the end of January, 1934, with the passage of the Gold Reserve Act,

TABLE 21–2. Dollar Prices of Selected Foreign Moneys, February and September, 1933, and January, 1934

Money	Price in February, 1933	Price in September, 1933	Price in January, 1934	Percentage Increase, February, 1933 to January, 1934
English pound	\$3.422	\$4.665	\$5.032	47
French franc	0.032	0.058	0.065	49
Australian pound	2.722	3.713	4.088	48
Canadian dollar	0.835	0.965	0.992	19

the United States re-established a gold standard. The principal provisions of this act were the following:

1. The President was authorized to fix the gold value of the dollar at not less than 50 percent nor more than 60 of the old level. This meant that he could define the dollar as not less than 11.61 grains nor more than 13.93 grains; the price of gold could be fixed at not more than \$41.34 nor less than \$34.45 an ounce—the latter being the price reached by January under the gold-buying program.

On January 31, 1934 the President set the price of gold at \$35 an ounce, expressly reserving the right to alter it as the country's interest might require. Not until 1945 was this discretionary power repealed.[6] The gold content of the new dollar was 13.71 grains, a reduction of 40.94 percent. The Treasury reaped a handsome profit by raising the price of

[5] *Ibid.*, vol. ii, p. 428.
[6] The buying price is actually ¼ of 1 percent below \$35 and the selling price is ¼ of 1 percent above it.

gold from $20.67 to $35 an ounce. It gained $14.33 on each of its nearly 196 million ounces of holdings, or $2805 million.

2. It nationalized all gold, provided that all profits or losses resulting from changes in the price of gold should accrue to the Treasury, and ended the domestic redeemability of currency in gold.

3. It ended the coinage of gold for domestic use and provided that all existing gold coins should be formed into bars.

4. It provided that gold might be held, transported, imported, exported, and otherwise dealt in only in accordance with regulations prescribed by the Secretary of the Treasury with the approval of the President. In practice, these regulations permitted free imports and exports, but limited domestic holding and dealing to "legitimate" commercial, industrial, artistic, and scientific purposes.

5. It provided that $2 billion of the gold profits should be used to establish an exchange-stabilization fund under the Secretary of the Treasury. Thus, the Secretary was given broad powers to regulate foreign-exchange rates and even to affect domestic credit conditions through his management of the exchange-stabilization fund.

In summary, the nation had abolished the gold-coin standard, established a limited gold-bullion standard, decreased the gold content of the dollar 40.94 percent, and raised the price of gold 69.33 percent.

Silver Policies

By the end of 1932, the market price of silver had fallen to only 24.6 cents an ounce, a price that was hardly to the taste of the silver-mining interests and their spokesmen in Congress. These groups argued that a greater monetization of silver and an increase of its price would not only assist the silver-mining industry, but also help bring the country out of depression and deflation. They even brought forth a new argument that Bryan had not used: We should raise the price of silver to help "the teeming millions in the Orient." They pointed out that as the price of silver fell, the prices of Oriental silver money declined in terms of gold money, thereby—they argued erroneously—decreasing the purchasing power of Oriental countries in the world markets. Their remedy was as simple as it was fallacious; raise the price of silver, thereby raising the prices of Oriental silver money in foreign-exchange markets, and also raising the purchasing power of the Orient in world markets.

As already noted, the legislation of May, 1933, gave the President broad discretionary powers to accept silver in payment of war debts, to purchase the metal, to establish bimetallism, and to enter into international silver agreements. He did not establish bimetallism, and only

limited amounts of silver were received in payment of war debts.[7] Nevertheless, the Treasury acquired very large amounts of silver under other programs. Senator Pittman, an ardent silverite and a United States delegate to the London Economic Conference in mid-1933, persuaded a number of silver-using and silver-producing countries to agree to measures raising the price of silver. The joker in the agreement was soon revealed. In effect, the United States had agreed to purchase annually an amount of silver equal to its entire domestic production, whereas the commitments of other countries were small indeed. The President ratified the London Silver Agreement in December, 1933, ordering the Treasury to purchase the entire domestic output at 64.64 cents an ounce. This price was about 50 percent above that previously prevailing.

Still dissatisfied, the proponents of silver pushed through the Silver Purchase Act of 1934. This Act directed the Secretary of the Treasury to purchase silver at home and abroad until the monetary value of the silver stock should be equal to one-third of the value of the monetary gold stock, or until the market price of silver should rise to the level of its monetary value ($1.29 an ounce). It also provided that in order to prevent excessive profits to speculators, no more than 50 cents an ounce should be paid for silver located in the United States on May 1, 1934. The President implemented the latter provision in August by nationalizing all silver at this price. Fortunately, the law did not prescribe the speed of silver purchases by the Secretary of the Treasury. He therefore bought as slowly as political conditions permitted. Nevertheless, his purchases were very large. Table 21–3 shows that, during the period 1934 to 1942, the Treasury purchased more than 2.6 billion ounces of silver at a total cost of more than $1.4 billion. It paid for the silver by issuing Treasury currency in the form of silver certificates. These silver acquisitions were of three types: (1) small amounts of nationalized silver purchased at 50 cents an ounce, (2) over 2 billion ounces of foreign silver purchased at an average price of 50.1 cents an ounce, and (3) about 500 million ounces of newly mined domestic silver. Newly mined domestic silver was, from the beginning, given preferential price treatment. But the initial price of 64.64 cents an ounce did not satisfy the silver groups for long. In 1939, they pushed through a law ordering the Secretary to pay 71.11 cents an ounce for all newly mined domestic silver offered to him. In 1946, they again entered the fray, raising the price to 90.5 cents an ounce. These purchases were discontinued only in 1963.

[7] For an excellent brief discussion of American silver policy, see G. Griffith Johnson, *The Treasury and Monetary Policy, 1932–1938*, Harvard University Press, Cambridge, pp. 161–200.

As massive United States purchases doubled the price of silver in world markets, "the teeming millions in the Orient" wished for fewer "helpful" friends. Rising exchange rates on silver currencies decreased

TABLE 21–3. Silver Production in the United States and Silver Purchases by the Government, 1934–1942
(In millions)

Year	Silver Production in the U.S. (Ounces)	Silver Acquired by U.S. Government: Newly Mined Domestic Silver (Ounces)	(Dollars)	Nationalized Silver (Ounces)	(Dollars)	Foreign Silver (Ounces)	(Dollars)	Total Acquisitions (Ounces)	(Dollars)
1934	32.5	21.8	14.1	110.6	55.3	172.5	86.5	304.9	155.9
1935	45.6	38.0	27.3	2.0	1.0	494.5	318.2	543.1	346.5
1936	63.4	61.1	47.3	0.4	0.2	271.9	150.3	333.4	197.8
1937	71.3	70.6	54.6	....	....	241.5	108.7	312.1	163.3
1938	61.7	61.6	42.4	....	....	355.4	156.9	417.1	199.3
1939	63.9	60.7	40.1	....	....	282.8	120.5	343.5	160.6
1940	67.0	68.3	48.5	....	....	139.8	50.9	208.1	99.4
1941	71.1	70.5	50.1	....	....	72.6	27.1	143.1	77.2
1942	55.9	47.9	34.0	....	....	14.3	6.0	62.2	40.0
Total	532.4	500.5	358.4	113.0	56.5	2045.3	1025.1	2658.5	1440.0

SOURCE: *Treasury Bulletins.*

the ability of these countries to export without drastic reductions in their domestic prices. This deflationary pressure was intensified as some of their silver money was melted and exported. In the end, most silver countries abandoned silver standards, and adopted inconvertible standards or tied their money to the dollar or the British pound. Thus, the long-run effect of United States silver policy was to reduce still further the monetary use of silver abroad.

Other Relevant New Deal Measures

We cannot review here all the other New Deal measures that affected the structure and functioning of the monetary and financial system. Several of them related to the Federal Reserve System. A number of amendments effected a greater centralization of authority in the System. For the first time the System was given legal authority to regulate margin requirements on security loans and to alter member-bank reserve requirements.

Many new institutions were established to restore the flow of credit. Among the most important of these were the FDIC and many new agencies in the fields of housing and agricultural credit.

THE GOLDEN AVALANCHE

Monetary conditions in the United States prior to her entrance into World War II at the end of 1941 were largely dominated by the inflow of gold and silver resulting from the combination of United States policies and developments abroad. Largely reflecting silver purchases, Treasury currency outstanding rose about $1 billion between the end of 1932 and the end of 1941. This tended, of course, to increase directly both the public's money supply and member-bank reserves. But far greater was the increase in the monetary gold stock. At the end of 1933, the United States monetary gold stock was at $4 billion; eight years later it was at $22.7 billion; this was an increase of $18.7 billion (see Table 21–4). A small part of this increase resulted from domestic gold production and melting of gold scrap; another part ($2805 million) resulted from the revaluation of the existing gold stock when the price of gold was increased in early 1934. But by far the largest part—more than $16 billion—came from net gold imports. Some of these gold imports reflected the excess of United States exports of goods and services over her imports, but a very considerable part represented the movement of capital funds to the United States, many of them seeking safety from political and military threats abroad.

The period was one of greatly increased gold output in all gold-producing areas. This rise began early in the depression, even before the price of gold began to rise. With its price pegged by monetary authorities, gold was the only commodity whose production was enhanced by deflation. Declines in the prices of other things lowered the cost of producing gold. But marked increases in the price of gold while the prices of other things remained constant, or at least did not rise in proportion, enhanced gold production still more. Table 21–5 indicates that, by the late 1930s, the output of gold in ounces was double its level in the 1920s. And, because of the increase in the price of gold, the dollar value of current gold output was more than triple its level of a decade earlier.

The supply of gold for monetary purposes was further augmented from two other sources. Large but unknown amounts came from the melting of gold scrap as both the price and the purchasing power of gold rose. Larger amounts were released from hoards in the Orient. For example, during the relatively prosperous 1920s, British India absorbed about 3½ million ounces of new gold each year. But, as her own prosperity dwindled, and as the purchasing power of gold abroad rose to unprecedented levels, she threw large amounts of the yellow metal on world markets. Her net exports for the period 1931 to 1940 amounted to 41 million ounces, worth about $1.4 billion.

TABLE 21–4. Monetary Gold Stock of the United States, 1929–1941[a]
(In millions of dollars)

End of:	Monetary Value of Gold Stock	Increase During Year	Value of Domestic Gold Production	Net Gold Imports
1929	$ 3,997			
1930	4,306	$ 309	$ 43	$ 280
1931	4,173	− 133	46	145
1932	4,226	53	46	− 446
1933	4,036	− 190	47	− 174
1934	8,238	4,202	93	1,134
1935	10,125	1,887	111	1,739
1936	11,258	1,132	132	1,117
1937	12,760	1,502	144	1,586
1938	14,512	1,751	149	1,974
1939	17,644	3,132	162	3,574
1940	21,995	4,351	170	4,744
1941	22,737	742	170	982
Addendum:				
Dec. 31, 1933– Dec. 31, 1941		$18,708	$1314	$16,655

[a] For basic data and explanations of the contents of these figures, see Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics*, Washington, D.C., 1943, pp. 522–525, 536.

SOURCE: Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics*, p. 542, and *Federal Reserve Bulletins*.

TABLE 21–5. World Gold Production

Period	Production in Millions of Fine Ounces	Index of Physical Gold Production, Average 1923–1929 = 100	Value in Millions of Dollars ($20.67 an Ounce, 1933 and Earlier; $35 an Ounce in 1934 and Later)	Index of Value Average 1923–1939 = 100
1923–1929 (annual average)	18.8	100	$ 388.6	100
1930	20.9	111	432.1	111
1931	22.3	119	460.7	119
1932	24.1	128	498.2	128
1933	25.4	135	525.1	135
1934	27.4	146	958.0	247
1935	30.0	160	1050.0	270
1936	32.9	175	1152.6	296
1937	35.1	187	1229.1	316
1938	37.7	201	1319.6	340
1939	39.5	210	1383.7	356
1940	41.1	219	1437.3	370
1941	36.2	193	1265.6	326

SOURCE: Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics*, p. 542, and *Federal Reserve Bulletins*.

OTHER ASPECTS OF MONETARY POLICY, 1934 TO 1941

As noted earlier, monetary conditions in the United States had again become relatively easy by the latter part of 1933. Member banks owed the Federal Reserve only about $100 million and held nearly $800 million of excess reserves. Then came the great inflow of funds from the Treasury's silver purchases and the golden avalanche. By mid-1934, member-bank borrowings had fallen below $50 million. From that time until well after America's entrance into World War II, they rarely amounted to as much as $10 million. Banks did not need to borrow; they were swamped by excess reserves. The latter rose from less than $800 million in late 1933, to $2.9 billion in mid-1936. In the latter part of 1940, they were above $6.6 billion. Federal Reserve discount rates were of little importance under these conditions, but, by mid-1935, they had been lowered to 1 percent at the New York and Cleveland Reserve Banks, and to 1½ percent at the others. They were not raised again until after World War II.

By mid-1936, when the excess reserves of member banks had reached $2.9 billion, and gold was still flowing in rapidly, Federal Reserve and Treasury officials feared that they might lose control of the situation, and that inflation might occur. The country had not yet recovered fully from the depression. About 14 percent of the labor force was still unemployed and real national output was still about 5 percent below its level in 1929. Nevertheless, real output had already risen about 37 percent above its lowest level in 1933 and was still rising, and wholesale prices had risen 23 percent though they were still 16 percent below their levels in 1929. Federal Reserve and Treasury officials agreed that to protect against inflation in the future, they should take some of the "slack" out of the system without going so far as to restrict credit currently.

They took two actions to this end. For one thing, the Board of Governors used for the first time its recently acquired power to change member-bank reserve requirements. In three steps—the first on August 16, 1936, and the last on May 1, 1937—it doubled all these requirements, thereby setting them at the maximum level permitted by law. In addition, the Treasury embarked on a policy of "sterilizing" all gold imports. Between the end of 1936 and mid-1937, it sterilized about $1.3 billion of gold inflows, thereby preventing this amount from augmenting the public's money supply, commercial-bank reserves, and Federal Reserve bank reserves. It did this by selling government securities to get the funds with which to pay for the gold and then adding the gold to its own

"cash holdings" without issuing gold certificates against it. In effect, it engaged in an offsetting open-market operation.

As a consequence of these Federal Reserve and Treasury actions, the excess reserves of member banks were reduced to $750 million by August, 1937. These excess reserves seem to have been widely distributed, for member-bank borrowings did not rise above $24 million. Credit conditions tightened somewhat. In 1938, business activity declined sharply but briefly, reflecting largely a shift from inventory accumulation in 1937 to inventory decumulation in 1938. Both the Federal Reserve and the Treasury thereupon reversed their policies. On April 16, 1938, the Board of Governors lowered member-bank reserve requirements (see Table 21–6). In the same month, the Treasury "desterilized"

TABLE 21–6. Member-Bank Reserve Requirements, 1936–1941

	Percentages in Effect					
	1917–Aug. 15, 1936	Aug. 16, 1936	Mar. 1, 1937	May 1, 1937	Apr. 16, 1938	Nov. 1, 1941
Demand deposits						
Central Reserve cities	13	19½	22¾	26	22¾	26
Reserve cities	10	15	17½	20	17½	20
Other	7	10½	12¼	14	12	14
Time deposits	3	4½	5¼	6	5	6

about $1.2 billion of its idle gold holdings, adding that amount to both member-bank reserves and Federal Reserve bank reserves. These actions, together with continued gold inflows, quickly brought excess member-bank reserves above $3 billion, from which level they continued to rise.

Money-market conditions were extraordinarily easy during the rest of this period. Short-term, open-market rates were especially low. The yield on Treasury bills was usually less than ½ of 1 percent, sometimes much less. Yields on long-term governments gradually fell to less than 2 percent, far below their levels of more than 3½ percent in 1929 and 3⅓ percent in 1930.

This period witnessed a very important innovation in the objectives of Federal Reserve open-market operations in United States government securities—a change that proved to be highly significant both during World War II and in the postwar period. Prior to 1937, Federal Reserve purchases and sales of government securities were primarily for the

purpose of affecting the reserve positions of member banks, thereby regulating general monetary and credit conditions. But in 1937, for the first time in its history, the Federal Reserve bought long-term government securities primarily because of the direct effects of its purchases upon their market prices. In this case, it bought long-terms to bolster their prices and sold short-terms to prevent the operation from increasing member-bank reserves. Between this time and the entrance of the United States into World War II, it engaged in several operations of this sort. Sometimes it bought long-terms to bolster their prices; at other times, it sold these securities to retard increases in their prices.

TABLE 21-7. Member-Bank Reserve Positions on Selected Dates, 1933-1941
(averages of daily figures, in millions of dollars)

Period	Actual Reserve Balances	Required Reserves	Excess Reserves
Last quarter, 1933	$ 2,612	$1,839	$ 773
Feb., 1934	2,822	1,931	891
June, 1934	3,790	2,105	1,685
June, 1935	4,979	2,541	2,438
June, 1936	5,484	2,891	2,593
July, 1936	5,861	2,954	2,907
May, 1937	6,932	6,005	927
Aug., 1937	6,701	5,951	750
May, 1938	7,587	5,062	2,525
June, 1939	10,085	5,839	4,246
June, 1940	13,596	6,900	6,696
Dec., 1940	14,049	7,403	6,646
June, 1941	13,201	7,850	5,351
Dec., 1941	12,812	9,422	3,390

SOURCE: Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics*, Washington, D.C., 1943, pp. 372–373.

Federal Reserve officials insisted that they would not "peg" these prices at an inflexible level. They would allow the prices and yields of these securities to adjust themselves to levels consistent with the other objectives of monetary policy. The only purpose of Federal Reserve intervention, they insisted, was to prevent "disorderly" markets in these securities and to secure "orderly" adjustments of prices and yields. But it proved to be but a short step from a policy of maintaining "orderly markets" to one of pegging these security prices at inflexible levels, and this step was taken early in World War II.

FEDERAL FISCAL POLICIES

A brief look at federal fiscal policies during the 1930s will shed light on some aspects of the behavior of money during this period. After criticizing President Hoover for deficit financing and himself taking initial steps to reduce government expenditures, President Roosevelt soon embarked on a policy of increased expenditures and deficit financing. Even before the beginning of the defense program in 1940, federal expenditures had risen to more than three times their level in 1929. Some of the increase represented a rise of expenditures for public works and other goods and services, some transfer payments to the public, and some grants to state and local governments. But these increased expenditures did not succeed in ending the depression before the United States embarked upon a massive armament program. For this there were many reasons, of which only a few can be noted.

TABLE 21–8. Federal Expenditures and Receipts, 1929–1941 (in billions)

Calendar Year	Purchases of Goods and Services	Other Expenditures	Total Expenditures	Receipts	Surplus (+) or Deficit (−)
1929	$ 1.3	$1.3	$ 2.6	$ 3.8	+$ 1.2
1930	1.4	1.4	2.8	3.0	+ 0.2
1931	1.5	2.7	4.2	2.0	− 2.2
1932	1.5	1.7	3.2	1.7	− 1.5
1933	2.0	2.0	4.0	2.7	− 1.3
1934	3.0	3.4	6.4	3.5	− 2.9
1935	2.9	3.6	6.5	4.0	− 2.5
1936	4.8	3.7	8.5	5.0	− 3.5
1937	4.6	2.6	7.2	7.0	− 0.2
1938	5.3	3.2	8.5	6.5	− 2.0
1939	5.2	3.8	9.0	6.7	− 2.3
1940	6.2	3.9	10.1	8.6	− 1.5
1941	16.9	3.6	20.5	15.4	− 5.1

SOURCE: U.S. Department of Commerce, *National Income*, Washington, D.C., 1954, pp. 170–173.

1. Small Scale of Federal Spending. At the beginning of the depression, in 1929, when GNP was at about $104 billion, total federal expenditures were only $2.6 billion, or 2.5 percent of GNP. Thus, even a large percentage rise of government expenditures from this level had but a small leverage effect relative to the capacity level of output.

2. Long Delay in Instituting the Policy. The economy had been de-

teriorating for more than three years before any deliberately expansionary expenditures policy was adopted.

3. Increases of Effective Tax Rates. Time and again old taxes were increased and new ones imposed. This is reflected in the rise of tax collections, while GNP remained below its level in 1929. For example, in 1937, when GNP was still 13 percent below its level in 1929, federal tax collections were up 84 percent. A considerable part of the expansionary effects of increased government expenditures was absorbed by the increase of effective tax rates, which inhibited the rise of disposable private incomes. Government deficits during this period averaged about $2.5 billion a year, or less than 2½ percent of the 1929 level of GNP.

As a result of these fiscal policies, the federal debt rose from $16 billion at the end of 1929 to $41.4 billion at the end of 1939 and then to $57.5 billion by the end of 1941. A major part of the rise in the money supply during the latter part of the 1930s reflected increases in bank holdings of these obligations.

THE MONEY SUPPLY

Such liberalizing actions as were taken by the Federal Reserve in the early part of the depression did not succeed in preventing a large decrease in the money supply. Between mid-1929 and mid-1933, the money supply fell from $26.1 billion to $19.2 billion, a decline of $6.9 billion, or 26 percent. Table 21–9 shows that the major reason for this was the $19 billion decrease of commercial-bank loans and security holdings.

Between June, 1933 and the end of 1939, the money supply rose from $19.2 billion to $36.2 billion. Thus, at the end of this period, the money supply was 90 percent above its level at the bottom of the depression, and 40 percent above its level in 1929. This rise resulted largely from the rise of the monetary gold stock and increased commercial-bank holdings of federal securities. This rise of the money supply was accompanied by a less than proportional rise in expenditures for output. While the money supply rose about 90 percent, GNP in current prices increased from $56.0 billion in 1933 to $91.1 billion in 1939, or an increase of 63 percent.

CONCLUSIONS

Monetary conditions in the United States during the period beginning in 1934 were far easier than any the country had ever seen prior to that time. The banking system was flooded with excess reserves. Yet the nation

did not recover fully from the depression until about eight years later, after it had entered World War II. Should we conclude from this experience, as some have done, that monetary policy must always be in-

TABLE 21–9. The Money Supply and Its Direct Determinants, 1929–1939
(In billions)

	Amount June 29, 1929	Amount June 30, 1933	Amount Dec. 30, 1939	Change 1929–1933	Change 1933–1939
SOURCES					
Monetary gold	$ 4.0	$ 4.0	$17.6	......	+$13.6
Treasury currency	2.0	2.3	3.0	+$ 0.3	+ 0.7
Federal Reserve Credit	1.4	2.2	2.6	+ 0.8	+ 0.4
Commercial-bank credit					
Loans	35.7	16.3	17.2	− 19.4	+ 0.9
U.S. government securities	4.9	7.5	16.3	+ 2.6	+ 8.8
Other securities	8.7	6.5	7.1	− 2.2	+ 0.6
Total sources	$56.7	$38.8	$63.8	−$17.9	+$25.0
COMPETING USES					
Foreign deposits	$ 0.4	.....	$ 1.2	+$ 0.4	+$ 1.2
U.S. government balances	0.6	$ 1.2	3.9	+ 0.6	+ 2.7
Time deposits	19.6	10.8	15.3	− 8.8	+ 4.5
Capital accounts (net)	10.0	7.6	7.2	− 2.4	− 0.4
Total competing uses	$30.6	$19.6	$27.6	−$11.0	−$ 8.0
MONEY SUPPLY (TOTAL)	26.1	19.2	36.2	− 6.9	+ 17.0
Demand deposits	22.5	14.4	29.8	− 8.1	+ 15.4
Currency outside banks	3.6	4.8	6.4	+ 1.2	+ 1.6

effective in combating depression and unemployment? Only somewhat less sweeping and more tentative conclusions seem justified. One is that the effectiveness of an easy-money policy is likely to be seriously reduced if the policy is long delayed. The liberalizing policies employed in 1930 and the first eight months of 1931 were not aggressive; some member banks were still in debt to the Federal Reserve and others held only relatively small amounts of excess reserves. Few were in such condition that they felt excessively liquid and impelled to seek additional earning assets. Then came the 1931 episode and the restrictive policies accompanying it. The easy-money policy of 1932 lasted only a few months, terminated by the banking panic of early 1933. The depression had already been under way for more than three years before an aggressive easy-money policy of some duration was followed. By this time, the economy was so depressed, the liquidity and solvency of borrowers so

impaired, and excess capacity so widespread, that easy money was unlikely to bring a surge of recovery even if it slowed the decline.

Another important point suggested by this experience is that the effectiveness of monetary policy may depend greatly on the soundness of financial institutions. About 1350 commercial banks closed their doors in 1930, another 2300 in 1931, still another 1450 in 1932, and 4000 in 1933. Many other types of financial institutions were also failing. In such a situation, the public became afraid to entrust its money to these institutions, and the institutions, fearing runs, were in many cases unwilling to make investable funds available. It is to be hoped that many of the institutions and practices adopted since the 1930s have made our financial system less vulnerable. Among these are better regulation of financial institutions and practices, the FDIC, the FSLIC, insurance of mortgages, the Federal Home Loan banks, and so on. But perhaps the best insurance against a collapse of financial institutions is to prevent the serious depressions that weaken them. This may require not only prompt and aggressive monetary policies but also prompter and more aggressive fiscal policies than were employed in the 1930s.

22. Monetary Policy, 1941 to 1951

With the entrance of the United States into World War II in December, 1941, the Federal Reserve again became, as it had been during World War I, a servant of the government's fiscal policy. All conflicting objectives were pushed aside; its overriding objective became that of assuring that the nation's war effort would not suffer from any lack of money. Moreover, it was to assure that the huge war effort would be financed without any rise of interest rates above the low levels prevailing in early 1942.

WARTIME FISCAL POLICIES

The federal government's fiscal policy during this period followed the usual pattern for all-out war, but on a huge scale. Its expenditures rose tremendously. Just before the beginning of the defense effort in mid-1940, they were at an annual rate of about $9 billion. By the fourth quarter of 1941, they had risen to an annual rate of more than $25 billion. By 1944, they were above $95 billion. Thus, at the peak of the war effort, federal expenditures were more than 10 times their level before the beginning of the defense program and were themselves greater than total GNP at anytime during the 1930s. More than 40 percent of the nation's output was being purchased for government purposes. Between mid-1940, when the accelerated defense program began, and mid-1946, when the wartime deficits ended, federal expenditures totaled more than $383 billion. This was more than twice as much as the federal government had spent during the preceding 150 years, nearly 100 times as much as it spent during the Civil War, and 10 times as much as it spent during World War I.

Tax collections were increased greatly, but not nearly as much as expenditures. The result was, of course, huge deficits. These averaged more than $40 billion a year during the period of active participation of the

United States in the war; in one year they were nearly $54 billion. For the six years following mid-1940, federal deficits totaled nearly $187 billion. The Treasury therefore faced the necessity of borrowing huge amounts to cover these deficits. In fact, its net borrowings during this six year period were $199 billion, of which $187 billion was required to cover its deficits and $12 billion was used to increase its money balance.

TABLE 22–1. Cash Operating Outgo, Income, and Deficits of the Federal Government, 1940–1946
(in millions of dollars)

Fiscal Year Ending June 30	Cash Operating Outgo	Cash Operating Income	Cash Operating Deficit
1941	$ 14,060	$ 9,371	$ 4,689
1942	34,585	15,291	19,294
1943	78,979	25,245	53,734
1944	94,079	47,984	46,095
1945	95,986	51,051	44,935
1946	65,683	47,784	17,899
Total	$383,372	$196,726	$186,646

SOURCE: L. V. Chandler, *Inflation in the United States, 1940–1948*, New York, Harper & Row, 1951, p. 62. Much of the material in this and the following chapter is taken from this book.

The Treasury again tried to borrow as much as it could in ways that would not involve an increase in the money supply. It used all the devices developed during World War I as well as new ones to sell securities to nonbank buyers: great bond-selling campaigns, pleas by movie stars and national heroes, 100-percent clubs, payroll-deduction plans, and so on. It did succeed in getting nonbank investors to increase their holdings of Treasury obligations by $109 billion. But this was not enough; the commercial banks increased their holdings by $68.3 billion, and the Federal Reserve banks by $21.3 billion.

WARTIME MONETARY POLICY

Federal Reserve assistance to Treasury financing during World War II differed in at least two important respects from that in World War I. In the earlier war, the Federal Reserve itself bought very few Treasury obligations; it gave its assistance primarily by lending to banks. In World War II, it lent very little to banks; it created additional money primarily by purchasing Treasury obligations, most of them in the open market rather than directly from the Treasury. It did establish very low preferen-

tial-discount rates on loans collateraled by short-term Treasury obligations collateral, but banks requested few loans. They did not need loans; they could get reserve money even more cheaply by selling short-term Treasury obligations to the Federal Reserve. Interest-rate policies also differed markedly in the two wars. Interest rates were allowed to rise during World War I. In general, each new bond issue carried interest rates somewhat above those on earlier issues. During World War II interest rates were not allowed to rise at all.

In March, 1942, the Federal Open-Market Committee agreed with the Treasury that, in general, the level of interest rates and yields on government securities should not be allowed to rise during the war and pledged the full cooperation of the System to this end. This promise was fully kept. Interest rates in general were at that time low by historical standards, and short-term rates were abnormally low relative to longer-term rates. This was partly because of the low demand for investable funds during the depression, partly because of the huge volume of excess reserves in the banking system. At the end of 1941, the latter were still

TABLE 22–2. Federal Borrowings, Their Use and Their Sources, 1940–1946 (in millions of dollars)

Fiscal Year Ending June 30	Federal Cash Operating Deficit	Increase or Decrease (—) of Treasury's General Fund Balance	Net Cash Borrowing	Net Increase in Amount of Federal Interest-Bearing Debt Held			
				By Nonbank Investors	By Federal Reserve and Commercial Banks	By Commercial Banks	By Federal Reserve Banks
1941	$ 4,689	$ 742	$ 5,431	$ 2,143	$ 3,318	$ 3,600	—$ 282
1942	19,294	358	19,652	12,869	6,761	6,300	461
1943	53,734	6,515	60,250	28,498	30,757	26,200	4,557
1944	46,095	10,662	56,757	32,913	23,899	16,200	7,699
1945	44,935	4,529	49,474	27,173	22,691	15,800	6,891
1946	17,899	— 10,450	7,439	5,431	2,191	200	1,991
Total increase for period	$186,646	$12,356	$199,003	$109,027	$89,617	$68,300	$21,317

SOURCE: L. V. Chandler, *Inflation in the United States, 1940–1948*, New York, Harper & Row, p. 73. This table was computed from various tables in *Treasury Bulletins*. It should be noted that the figures relating to debt reflect only the debt held outside the federal government itself; they do not include an increase of about $22 billion in federal debt held by government agencies and trust funds. These securities involved no borrowing outside the government itself; as the Treasury collected and spent social security taxes, it issued to the trust funds under its control government securities indicating a future obligation to pay social security benefits.

above \$3 billion. The pattern of yields stabilized by the Federal Reserve during the war period reflected these conditions. On 90-day maturities this yield was ⅜ of 1 percent; on 9- to 12-month maturities it was ⅞ of 1 percent; on 5-year maturities it was 1½ percent; on 10-year maturities it was 2 percent; and on the longest marketable Treasury issues, it was 2½ percent. The shape of this yield curve should be noted carefully, for it was to have important consequences.

The Federal Reserve's technique for preventing these various yields from rising—for preventing the prices of the securities from falling—was simple: It merely stood ready to buy without limitation all of these securities offered to it at the selected levels of prices and yields. In short, it stood ready to monetize, with high-powered reserve money, all the government securities offered to it by the banks and all other types of holders. As shown in Table 22–3, the System increased its holdings of

TABLE 22–3. Maturities of Governments Held by the Reserve Banks, 1941–1946 (last Wednesday of the month; in millions of dollars)

Date	Within 90 Days	90 Days to 1 Year	1 Year to 2 Years	2 Years to 5 Years	Over 5 Years	Total
Dec., 1941	\$ 96	\$ 97	\$247	\$ 477	\$1,337	\$ 2,254
Dec., 1942	1,199	886	242	1,408	2,254	5,989
Dec., 1943	7,256	2,457	224	488	1,190	11,615
Dec., 1944	12,703	4,064	760	620	918	19,065
Dec., 1945	15,839	7,000	0	508	691	24,038
June, 1946	17,877	4,436	46	449	582	23,390

Treasury obligations by \$21.3 billion between the end of 1941 and June, 1946. Its purchases were concentrated in the short maturities; in fact, its holdings of the longer maturities actually declined during the latter part of the war. This was partly because of the very large Treasury issues of short maturities, partly because of the shape of the yield curve. Private investors tended to shun the short maturities with their low yields and to purchase the longer-term, higher-yield obligations. At their Federal Reserve support prices, these longer-term obligations were just as liquid as the shortest maturities. They could be riskier than the short obligations only if purchased above the support price or if the support price were lowered or withdrawn. Most investors were confident that the latter would not happen during the war, and they suspected that support would be continued into the postwar period.

This passive, open-market policy had several important consequences, not only during the war but also in the postwar period.

1. The Federal Reserve thereby abandoned control over its volume of government holdings, the volume of bank reserves, and the money supply. To prevent yields from rising, it had to buy all securities offered to it, regardless of the identity of the seller and regardless of the purpose for which the newly created money would be used. Thus, banks and nonbank investors alike could get new money from the Federal Reserve at will, the only cost being the yield sacrificed on the securities sold.

2. The cost of getting such funds was the low yield on short-term government securities, for banks and all other types of financial institutions held billions of these.

3. By holding down interest rates on government securities, the Federal Reserve also held down interest rates on loans to private borrowers and assured a highly liberal supply of credit for private uses. The reason was that all holders of governments retained complete freedom to sell these holdings and to shift to other assets. Thus, not only banks, but all other lenders as well could get funds from the Federal Reserve to satisfy private demands, and they would do so in great volume if yields on private obligations tended to rise.

Table 22–4 shows that during the six years following 1939, the money supply rose from $36.2 billion to $102.4 billion, for an increase of 183 percent. By far the most important direct contributors to this increase were the $74.3 billion rise of commercial-bank holdings of government securities and the $22.5 billion increase of Federal Reserve holdings.

While following a passive general monetary policy, the authorities tried to prevent or limit nonessential private borrowing by using selective credit controls. For example, in the autumn of 1941 the Federal Reserve imposed for the first time a selective control over consumer credit, fixing maximum loan values and maximum periods of repayment. Banks were admonished to refuse loans for nonessential purposes. Authorities were established to pass upon the essentiality of new security issues. But these and other selective credit controls were far less effective in containing inflationary pressures, and even in limiting the expansion of credit for private purposes, than were the great variety of direct controls imposed on the economy early in the war.

THE WARTIME ROLE OF DIRECT CONTROLS

It soon became evident that the government's fiscal policy would create strong inflationary pressure as output approached capacity levels, if not before. The huge rise of government expenditures directly increased the demand for output; it also contributed greatly increased

amounts to private money incomes. Increased tax collections recovered some of this money from the private sectors, but not nearly enough to prevent disposable private incomes from increasing greatly. With greater disposable incomes, consumers would, if left free to do so, increase their consumption demands. The multiplier would operate upward, perhaps raising consumer spending more than government spending was rising. Something of the same sort would happen to business spending. Prospects for profitable new investment were highly favorable, disposable

TABLE 22–4. The Money Supply and Its Determinants, 1939–1945 (end-of-year figures, in billions)

	1939	1945	Net Increase 1939–1945
SOURCES			
Monetary gold stock	$17.6	$ 20.1	$ 2.5
Treasury currency	3.0	4.3	1.3
Total Federal Reserve credit	2.6	25.1	22.5
Commercial-bank credit			
U.S. government securities	16.3	90.6	74.3
Loans	17.2	26.1	8.9
Other securities	7.1	7.3	0.2
Total sources	$63.9	$173.5	$109.6
Less: AMOUNTS ABSORBED BY COMPETING USES			
U.S. government deposits and cash holdings	$ 2.0	$ 25.9	$ 23.9
Time deposits	15.1	29.9	14.8
Other competing uses	10.6	15.3	4.7
Total competing uses	$27.7	$ 71.1	$ 43.4
Equals: THE MONEY SUPPLY			
Demand deposits	$29.8	$ 75.9	$ 46.1
Currency outside banks	6.4	26.5	20.1
Total money supply	$36.2	$102.4	$ 66.2

business income was greatly increased, and credit was cheap. It became clear that something would have to be done to prevent consumers and business from spending as much as they wanted to spend and could afford to spend with their large and rising disposable money incomes. Inflationary pressures would have to be "repressed." This was not only to prevent or limit price inflation; it was also to prevent rising private demands from diverting productive resources away from the war effort.

A whole series of direct controls was used for these purposes. These included price ceilings on virtually every type of output, ceilings on

wages, and ceilings on rents. It was illegal for anyone to charge or to pay more than these prices. Also included were many types of controls over the production, distribution, and use of output. In general, producers could buy equipment and supplies only if permitted to do so by the government, and the quantities that they could buy were limited. Thus, total business spending was held down because the quantities of things business could buy were limited and the prices business could pay were limited by ceilings. In short, business was forced to spend less than it wanted to, many businesses were unable to spend all their current disposable incomes, and the inability of business to spend limited its demand for investable funds.

Consumer spending was similarly repressed. Consumers were forbidden to pay prices above the legal ceilings and the quantities of goods available was limited. Many were rationed. Many others, such as automobiles and most other consumer durables, simply were not being produced. Thus, consumer spending was repressed and households were virtually forced to save far more than they would have done in the absence of direct controls.

The repression of private spending was not, of course, complete. Consumer spending did rise, as did also the wholesale and cost-of-living price indexes. The latter did not reflect actual price increases that occurred through upgrading, quality deterioration, and black markets. Yet the repression was remarkably successful in view of the strength of the inflationary pressures.

In short, the country had not been in the war very long before it was in a state of suppressed inflation, or widespread, excess demands. The demand for output at existing prices had become far greater than the available supply. These inflationary pressures grew as the war progressed, partly because of the huge accumulation of private savings. For the years 1940 to 1945, inclusive, personal saving amounted to the huge sum of \$132.6 billion and corporate net saving aggregated \$28.5 billion. Total capital-consumption accretions of \$72.5 billion also enabled business to increase its liquidity to the extent that these funds could not be spent for replacement of plant and equipment. The private sectors used these huge savings in two principal ways: (1) to retire debt—many households and businesses were enabled to retire their debts completely or at least to reduce them markedly; (2) to acquire liquid assets—between the end of 1939 and the end of 1945, individual and business holdings of liquid assets rose from \$69 billion to \$227.5 billion, an increase of \$158.5 billion. Not only the size of this increase but also the liquidity of the assets should be noted. Of the total increase, \$59 billion was in holdings

of money itself—demand deposits and currency. Another $21.4 billion was in time deposits. Still another $75 billion was in highly liquid Treasury obligations. The nonmarketable issues, such as the E bonds, were redeemable at the Treasury on demand. The marketable issues were, in effect, redeemable on demand at the Federal Reserve at their support prices. The other $3.2 billion increase of liquid assets was in shares of savings-and-loan associations.

CONDITIONS AT THE END OF WORLD WAR II

The country had not escaped overt inflation during the war. By the end of 1945, consumer prices were 31 percent, and wholesale prices 39 percent, above their levels of six years earlier. Repressed inflationary pressures were very strong. The private sectors had accumulated a huge volume of liquid assets. Their money balances were now 183 percent above their level in 1939, and their total holdings of liquid assets were up 230 percent. Moreover, both business firms and households had accumulated unsatisfied wants in large volume. Many busines firms that had spent little or nothing for investment purposes during the depression, and had been prevented from spending during the war, now wanted to replace, to expand, or to modernize their plants and equipment. Large numbers of families, feeling that they had lived like Spartans during the war, now wanted to go on a spending spree and to buy the cars and other things that had not been available during the war. The inflationary potential in increased private spending was large indeed.

But there was another side to the story, a side that led many to forecast deep depression and widespread unemployment rather than inflation for the postwar period. Many feared that the decrease of government spending following the cessation of hostilities would bring disaster. The sharp drop of federal expenditures from their level of almost $100 billion a year would directly decrease the demand for output, set off a downward multiplier effect on consumption, and leave industry with so much excess capacity that virtually no investment expenditures would be justified. Such gloomy forecasts were one, but by no means the only, reason for the early dismantling of direct controls. They were also a force for a continued easy-money policy. When the predicted depression did not develop immediately after the war, many continued to insist that it was "just around the corner."

As the war drew to a close, the government quickly began to relax and to remove the whole complex of direct controls. Rationing of consumers' goods was dropped almost immediately, and other controls over the use

of raw materials and the production, distribution, and use of output were dismantled. Wage controls were abolished almost as soon as the war ended. Many goods and services were exempted from price controls immediately and other price ceilings were raised. By mid-1946, price controls were largely inoperative, and in the autumn they were abolished. Rent ceilings remained as almost the only remnant of the wartime system of direct controls.

Prices rose immediately as direct controls were relaxed and removed. During 1946 alone, wholesale prices rose more than they had during the entire 1939 to 1945 period, and the cost of living advanced two-thirds as much as it had during the preceding six years. By August, 1948, when prices reached their first postwar peak, wholesale prices had risen 120 percent, and the cost of living 76 percent, since 1939. Two-thirds of the total rise of wholesale prices and three-fifths of the increase in the cost of living had occurred since the end of the war.

MONETARY POLICY, 1946 TO 1948

Though direct controls over the economy were removed, Federal Reserve policies remained chained to their wartime objectives and methods of implementation. The System still used its powers to peg the prices and yields on Treasury obligations, and the pegged pattern of yields was for some time the same as it had been throughout the war. The range was from ⅜ of 1 percent on 90-day maturities to a top of 2½ percent on 25-year Treasury bonds. In short, during a period of full employment and inflation, the Federal Reserve was pegging a general level and pattern of interest rates that had evolved during the nation's worst depression. Not until March, 1951, when the war had been over more than five years, did the Federal Reserve complete its escape from this pegging pattern.

This passive, open-market policy of supplying additional Federal Reserve funds to anyone presenting securities at their pegged prices was potentially far more dangerous in the postwar period than it had been during the war. The wartime system of direct controls had effectively limited private demands for credit. As limitations on the quantities that they could purchase and on the prices they could pay limited their total spending, households and business firms limited their demands for credit. But as these limitations were removed, private buyers again became free to bid against each other for larger quantities, to pay higher prices, and to demand larger loans for the purpose. Moreover, all types of financial institutions were in a position to meet almost any foreseeable increase in private demands for credit, and to do so at low interest rates as long as

the Federal Reserve pegged yields on government securities, for they held huge amounts of these obligations. For example, at the end of 1945, commercial banks held $90.1 billion; life insurance companies, $20.6 billion; mutual savings banks, $10.7 billion; and savings-and-loan associations, $2.4 billion. Households and nonfinancial business firms also had large holdings that they could sell to get money to lend to others or to finance their own spending.

Reasons for the Pegging Policy

Why did the Federal Reserve continue, despite inflation, to maintain easy-money conditions through its pegging policy? In part, it was because of the widespread fear of unemployment. The long depression of the 1930s had left its indelible impression and almost a depression psychosis. Almost every year brought new forecasts of a coming decline. Moreover, the nation's new determination to promote the achievement and maintenance of "maximum employment, production, and purchasing power" was embodied in the Employment Act of 1946. Treasury and Federal Reserve officials were reluctant to take any action that might jeopardize the maintenance of prosperity. The policy was also made more acceptable by the current lack of faith in the efficacy of monetary policy. There was a widespread feeling that experience in the 1930s had proved that monetary policy was ineffective in combating depression. Many now asserted that it would be equally useless as an instrument for fighting inflation—that mildly restrictive policies would not be effective and that policies restrictive enough to halt price increases would throw the country into depression.

Concern for Treasury financing and for the prices of outstanding Treasury obligations was a major reason for continuing the policy. The Secretary of the Treasury was a strong and persistent advocate of pegging, and a stubborn opponent of increases in interest rates. Several of the relevant arguments are worth noting.

1. Increased rates on the federal debt would add greatly to the already large interest burden.

2. Fluctuating prices and yields on governments would greatly complicate the Treasury's refunding operations, a serious matter with about $50 billion of the debt maturing within a year and nearly $100 billion within five years.

3. An increase of yields on governments, which without a rise of coupon rates would mean a decline of their prices, would impose capital depreciation on financial institutions and other holders and might lead to panicky selling and loss of confidence in financial institutions. Officials

recalled the drastic decline of bond prices in 1920, when the federal debt was only $26 billion, and pointed to the greater possibilities of panic now that the debt was nearly 10 times as large and represented about 60 percent of all debt in the country.

4. Disturbances in the prices and yields of government securities would be transmitted to private securities and jeopardize prosperity. It was argued that not only low interest rates, but also stability of interest rates and bond prices promoted prosperity.

Open-Market Policy

Until July, 1947, nearly two years after V-J Day, the Federal Open-Market Committee continued to prevent yields on government securities from rising above the pattern selected early in 1942. In 1946 and early 1947 the prices of long-term governments rose somewhat above the pegged level. This was primarily because the extremely low level of short-term rates led investors to "play the pattern of the rates" and to shift their purchases toward the longer-term obligations. The first break from the wartime pattern came in July, 1947, when the Federal Reserve persuaded the Treasury to allow it to eliminate the ⅜ of 1 percent buying rate on Treasury bills. The next break came the following month, when the Treasury agreed to elimination of the ⅞ of 1 percent rate on 9- to 12-month certificates of indebtedness. But this did not mean that the Federal Reserve had ceased to limit increases of the yields on these shorter-term obligations. It had merely shifted its policy to one of maintaining the rates fixed by the Treasury on new issues.

Several aspects of open-market policy during the remainder of this period deserve emphasis:

1. Not until March, 1951, did the Federal Reserve permit the prices of long-term Treasury securities to fall below par or permit their yields to rise above 2½ percent. The prices of these obligations might rise above par, but the Federal Reserve intervened to the extent necessary to prevent their prices from falling below par.

2. In the last analysis, it was the Secretary of the Treasury who set the yields on new issues, and therefore the rates to be maintained by the Federal Reserve. And the Secretary consented to rate increases only reluctantly, belatedly, and to a limited extent. By the end of 1948, when the first postwar inflation had reached its peak, the yield on Treasury bills had been allowed to rise only from ⅜ of 1 percent to 1.13 percent, and that on 9- to 12-month certificates from ⅞ percent to 1¼ percent. These could hardly be considered high interest rates for a period of inflation.

3. This willingness of the Federal Reserve to buy government secu-

rities in unlimited amounts robbed its other instruments of all or most of their effectiveness for restrictive purposes. In effect, it provided the banking system and others with a means of escape from other Federal Reserve attempts to restrict them.

Other Monetary Policies

The Federal Reserve employed two types of selective credit controls during this period. In 1946, as stock-market activity began to rise markedly, the Board of Governors raised margin requirements on security loans to 100 percent, thereby putting the stock market on a "cash basis." This action probably inhibited the rise of stock prices and prevented a situation in which a highly speculative stock market might have enhanced inflationary expectations. It did not, of course, restrict the supply of credit for other purposes.

Regulation W, the selective control over consumer credit that had been imposed in the autumn of 1941 under the authority of an executive order of the President, was continued until November, 1947. It was then removed because Federal Reserve officials felt that they should exercise such a control only when specifically authorized by Congress to do so. They again imposed the control briefly following a temporary authorization by Congress in August, 1948. While it was in effect, Regulation W probably retarded somewhat, though it did not stop, the growth of consumer credit.

The Federal Reserve also increased discount rates three times. The first came in the spring of 1946, when the Reserve banks eliminated the ½ of 1 percent preferential rate applicable to loans collateraled by short-term Treasury obligations, leaving in effect their 1 percent rate. This was raised to 1¼ percent in January, 1948, and to 1½ percent the following August. These rate advances probably exerted some influence toward firmness, but their effects were small because the banks were largely out of debt to the Federal Reserve, and were likely to remain so while they held so many short-term Treasury obligations that they could sell to the Federal Reserve at will.

From October, 1942 until February, 1948, the Board of Governors maintained member-bank reserve requirements at the highest levels permitted by law, except that requirements against demand deposits in central-reserve city banks were at 20 percent rather than the maximum level of 26 percent. It then raised these latter requirements to 22 percent in February, 1948, and to 24 percent in June. In August, Congress enacted legislation giving the Board temporary permission to raise these requirements above the old maximum levels. The Board thereupon

raised requirements against demand deposits at all classes of member banks by 2 percentage points, and against time deposits by 1½ percentage points. In all, these 1948 increases raised required member-bank reserves by about $2.5 billion. Such a large increase of requirements would ordinarily have restricted credit markedly. In this case the major effect was to evoke sales of an additional $2 billion of securities to the Federal Reserve. There was an accompanying slight increase of interest rates, but the effectiveness of the increases in reserve requirements was largely negated by the passive, open-market policy.

The main argument of this section is not that these other Federal Reserve actions were wholly ineffective, but that the effectiveness of these restrictive actions was largely offset by the willingness of the Federal Reserve to supply reserve funds by purchasing Treasury obligations at relatively low and relatively stable yields.

MONETARY POLICY, 1949 TO MID-1950

After the first postwar peak of prices was reached in August, 1948, there followed more than a year of mild deflation. By the end of 1949, the cost of living had fallen 5 percent and wholesale prices were down 11 percent. In fact, the year 1949 was one of mild recession, with small declines of both production and employment. This was largely because net accumulations of business inventories in 1948 gave way to net decumulations of inventories in 1949. The Federal Reserve halted its vain attempts to restrict credit, and initiated an easier money policy. Early in the spring of 1949, it eliminated its regulation of consumer credit. The temporary authorization to employ this type of regulation expired in June. It also lowered member-bank reserve requirements. In several steps, beginning in May and ending in September, it lowered reserve requirements against demand deposits by four percentage points at all classes of member banks. Requirements against time deposits were reduced from 7½ to 5 percent. The Treasury lowered somewhat the yields on its new issues and the Federal Reserve stood ready to prevent market rates from rising above these lowered levels.

Under these conditions of mild deflation, the controversy between the Federal Reserve and the Treasury died down. In such a situation, there is no necessary conflict between the objective of promoting general economic stabilization, including stability of price levels, and the objectives of holding down interest costs on the national debt, facilitating Treasury financing operations, and preventing decreases in the prices of outstanding Treasury bonds.

By early 1950, the decline in business activity and prices had stopped, and recovery was well under way. There was still some unemployment, but economic activity was at a high level. As to the future course of business activity and price levels, there was wide disagreement among economic forecasters. The outbreak of fighting in Korea late in June, 1950, ended this uncertainty, and ushered in a new upsurge of inflation.

MONETARY POLICY AFTER THE OUTBREAK OF FIGHTING IN KOREA

The outbreak of fighting in Korea, and this country's decision to intervene, touched off a surge of buying by consumers and business firms. Remembering the scarcities and price increases of World War II, consumers rushed into the markets to get ahead of the hoarders. Business firms also hastened to replenish their inventories and to make net additions to them. Only later, toward the end of 1950, did the rise of government expenditures for military purposes add its inflationary effects to the rise in private spending. Much of this latter increase was financed by sales of liquid assets, decreases in holdings of idle money balances, and expansions of credit. The velocity of money increased appreciably, redemptions of savings bonds rose, consumer credit expanded, and business loans increased markedly. Between May, 1950 and March, 1951, the cost of living rose 8 percent, and wholesale prices 19 percent. During the rest of 1951, price levels remained relatively constant, the cost of living rising slightly and wholesale prices declining a little.

With the resurgence of inflation, the controversy between the Federal Reserve and the Treasury flared anew. The Federal Reserve wanted to restrict credit to curb the rise of prices, while the Treasury insisted that it continue to hold interest rates at an inflexibly low level. This controversy had begun to develop even before the Korean outbreak. Foreseeing a possible revival of inflation, the Federal Reserve had on two occasions—one late in 1949 and the other early in 1950—requested the Treasury to postpone public announcement of rates on its future short-term issues in order to see whether a rise in rates might be in order. On both occasions, the Treasury responded by announcing immediately that the forthcoming issues would bear yields no higher than those currently being maintained in the market. And, on both occasions, the Federal Reserve obediently continued to hold market rates in line with those on the new Treasury issues. But in August, 1950, the controversy came out into the open and the Federal Reserve publicly defied the Treasury. On the same day and at almost the same hour the two issued conflicting public an-

nouncements. The Federal Open-Market Committee announced the System's determination to fight the current inflation and to use all its powers to this end. At the same time, the Treasury announced a new $13-billion issue of short-term securities with yields no higher than those currently prevailing in the market. Despite this Treasury challenge, the Federal Reserve proceeded to tighten credit somewhat. To prevent the Treasury's financing from failing, the System purchased most of the new issue at the yields fixed by the Treasury. Then it sold some of its other holdings in the market on terms that raised the market yields of short-term obligations. It also raised its discount rates from 1½ to 1¾ percent. This controversy in 1950 related only to short-term issues; the Federal Reserve continued to prevent the prices of long-term government bonds from falling below par.

In early 1951, the controversy spread to the prices and yields on long-term Treasury bonds. A major reason for the Federal Reserve's rebellion was its fear that its other attempts to contain inflation would be ineffective as long as it had to peg the prices of these securities. In January it raised member-bank reserve requirements against demand deposits by two percentage points. Acting under new congressional authorization, it reimposed selective controls on consumer credit and imposed a similar selective regulation on credit for residential construction. It also encouraged commercial banks, insurance companies, savings banks, and some other financial institutions to enter into a voluntary credit-restraint program to prevent or lessen the extension of credit for "nonessential" purposes. But Federal Reserve officials doubted that these measures alone could stop the inflation. The policy of pegging Treasury bond prices at par would have to end.

The conflict between the Federal Reserve and the Treasury in early 1951 became dramatic. In January, the Secretary of the Treasury publicly announced that, during the defense period, all the government's issues of marketable securities (for new money as well as for refunding purposes) would bear interest rates no higher than 2½ percent. He also implied, without stating it specifically, that the Federal Reserve had agreed to this policy. Reserve officials denied that this was true. The President and the Council of Economic Advisors then leaped into the fray to support the Treasury position. After a White House conference with Federal Reserve officials, the President publicly announced that the Federal Reserve had, in effect, agreed to the Treasury's announced policy. This the Federal Reserve publicly denied. Now that the controversy was out in the open and involved the President himself, it became a hotly debated issue in Congress, in the newspapers, and in financial circles. The Board of Gov-

ernors finally informed the Treasury that, as of February 19, it was no longer willing to maintain the existing situation in the government-securities market. After further negotiations, the Treasury and the Federal Reserve jointly announced on March 4, 1951, their now-famous "accord":

> The Treasury and the Federal Reserve System have reached full accord with respect to debt-management and monetary policies to be pursued in furthering their common purpose to assure the successful financing of the Government's requirements and, at the same time, to minimize monetization of the public debt.

The Treasury–Federal Reserve accord of March 4, 1951, stands as a landmark in American monetary history, for it marked the end of inflexible pegging of the prices of Treasury obligations. Nine years after it had first adopted the policy in March, 1942, the Federal Reserve had finally regained at least some freedom to refrain from purchasing all securities offered to it, to limit its creation of bank reserves, and to restrict credit when necessary to prevent inflation. To the extent that it was freed from the task of supporting Treasury operations, it could now direct them more toward promoting economic stability.

23. Monetary Policy, 1951 to 1959

BACKGROUND

Though the Treasury–Federal Reserve accord of March, 1951 freed Federal Reserve officials from the shackles of an inflexible pegging policy and gave them greater latitude to develop new policy patterns, it did not provide them with new patterns. They now faced the task of developing new policy objectives and guides and new patterns of policy implementation. In doing so, they faced many problems, some of them quite unfamiliar. They were not hampered by any shortage of reserves or any lack of earning assets to sell for restrictive purposes. Holding more than $21 billion of gold certificates and having actual reserve ratios nearly double the required level, the Reserve banks had ample capacity to expand credit whenever that might be appropriate. Their holdings of more than $22 billion of government securities at a time when total member-bank reserves were about $19 billion gave them plenty of power to restrict credit. Their problem was not a lack of power; it was rather to decide how and for what purposes their power should be used.

A major purpose of the accord was to give the Federal Reserve greater freedom to restrict credit whenever such a policy was appropriate. But the Federal Reserve had not followed a really restrictive policy in about 20 years. Many, if not most, Federal Reserve officials had never administered such a policy. Nor had most members of the financial community experienced really restrictive policies. Since 1934, or for 17 years, credit conditions had been easy, and interest rates low and relatively stable. How would the members of the financial community react to rising interest rates and falling bond prices? Would they become panicky, as some predicted? Or would they hold on to their bonds, as others forecasted? No one could be sure.

It was expected that, with the abandonment of pegging, Federal Re-

serve discount policy would again become important. Unable to secure reserves on demand by selling government securities to the Federal Reserve, member banks would have to apply for loans. But, for 17 years, Federal Reserve lending had been of little importance. From 1934 until World War II, member banks had been so swamped with excess reserves that very few had any need to borrow. Since that time, most of them had adjusted their reserve positions by selling government securities. Many bankers had never applied for a loan and knew little or nothing about Federal Reserve lending policies. Moreover, Federal Reserve officials were by now inexperienced in the use of this instrument, and needed to reconsider the whole problem of discount policy and discount rates.

The economic environment had changed markedly since the Federal Reserve had last followed really restrictive policies. For one thing, the federal debt was now far larger and more important. When the Federal Reserve took restrictive actions in the late 1920s, the federal debt was only $16.5 billion and made up only 8 percent of all debt in the country. No one then expected the System to stabilize the prices of government bonds, or even to allow its policy to be influenced by the behavior of government bond prices. Now the federal debt held outside the Treasury was $219 billion and made up 45 percent of all debt in the country. A very large amount of it was short term and required frequent refinancing. Moreover, since 1937, the community had become accustomed to a Federal Reserve policy of stabilizing the prices of these obligations.

In the Employment Act of 1946 the nation had expressed its demand for a higher level of performance by the economy. Though the specific meanings of "maximum employment, production, and purchasing power" had not been defined, one thing was clear: the nation's tolerance for unemployment was far less than it had ever been before. The nation had also become acutely conscious of its capacity for economic growth and made continuous growth an important objective. At the same time, it was developing less tolerance for price inflation. After 12 years of price increases that had raised the cost of living nearly 90 percent, it wanted a higher degree of price stability.

Thus, the Federal Reserve faced the perplexing problem of reconciling its concern for the government securities market with its concern for economic stabilization. It also faced the no less perplexing problems of giving practical definitions to "maximum employment, production, purchasing power," and "the highest sustainable rate of economic growth," and of reconciling this objective with that of promoting price-level stability.

MONETARY AND DEBT MANAGEMENT POLICIES

During the period of pegging before March, 1951, the Federal Reserve entered the government-securities market in two principal ways: (1) to stabilize the prices of securities that were already outstanding, and (2) to assist the Treasury in selling new issues, whether these were to secure new money to cover current deficits or to pay off maturing issues. For the latter purpose the Federal Reserve frequently purchased a part of a new issue that others were not willing to buy at the yield rates fixed by the Treasury, and it sometimes bought outstanding issues of comparable maturities to "make room in the market" for the new Treasury issue.

The immediate purpose of the Federal Reserve at the time of the accord was not to withdraw completely from the government-securities market and leave both the prices of outstanding Treasury obligations and current Treasury-financing operations completely on their own. To withdraw support completely and abruptly after such a long period of pegging would have been both impossible and undesirable. Erratic, and perhaps even panicky, declines in the prices of outstanding securities would not only injure holders and jeopardize the future marketability of new long-term issues, but might also disturb the markets for private obligations and upset economic stability. Nor could it immediately withdraw all support of Treasury financing operations. To permit a new issue to fail and perhaps force the Treasury to default on a part of the national debt was unthinkable. The Federal Reserve's immediate purpose, therefore, was merely to secure somewhat greater flexibility—to permit the prices and yields of outstanding government securities to vary more widely and to get the Treasury to put more realistic yields on its new issues and to rely less heavily on Federal Reserve support. However, its longer-run purpose was to work toward a situation in which its open-market policies would be shaped almost exclusively by economic stabilization objectives, and its purchases and sales would again be directed exclusively toward regulating the reserve position of the banking system rather than toward influencing directly the prices of Treasury obligations, new or old.

With respect to outstanding government securities, Federal Reserve policy for some time immediately following the abandonment of pegging was one of "maintaining an orderly market." Federal Reserve officials insisted that this did not mean that they would limit the extent to which the prices of these securities would be permitted to decline if the price decline was consistent with the attainment of other Federal Reserve objectives. It meant only that they would assist in keeping these adjust-

ments "orderly" rather than "erratic" or "disorderly." The System then shifted to a policy of "preventing a disorderly market." This was not merely an exercise in semantics; it indicated a greater Federal Reserve tolerance of fluctuations in the prices of government securities, a lessened readiness to intervene to influence these prices directly, and a greater reliance on private purchasers and sellers to maintain "orderly" conditions. By the spring of 1953, the Federal Reserve had arrived at a new rule that would "normally" or "ordinarily" guide its open-market operations: it would not buy or sell longer-term Treasury obligations (those with maturities of more than a year), but would confine its operations to short maturities, preferably Treasury bills. This has come to be known popularly as "the bills-only doctrine." It also decided that thereafter it would not ordinarily engage in "swap operations," buying some maturities to raise their prices or to limit their price declines and selling others.

Federal Reserve officials had several closely related reasons for wanting to stay out of the market for long-term obligations and for confining their operations to bills and other short maturities where the direct effects of their purchases and sales on the prices of the securities would be much smaller.

1. They undoubtedly feared that if they continued to operate in the long-term market, they might again be shackled by an inflexible pegging policy. A policy of pegging prices inflexibly at some point below par could be almost as shackling as pegging at par.

2. They wished to avoid possible charges that their sales of long-term securities, or even their refusal to buy them, had unfairly imposed losses on holders.

3. The reason stressed most by Federal Reserve officials was their desire to create conditions in which private buyers and sellers would themselves develop an orderly and self-reliant market. They argued that as long as private operators in this market expected Federal Reserve intervention, they would not perform the ordinary security-market functions of taking speculative positions, buying when they thought prices were too low, selling short when they thought prices were too high, and arbitraging among the various issues to establish reasonable yield relationships. It was hoped that, after the Federal Reserve's withdrawal from the long-term market, private operators would themselves develop a "broad, deep, and resilient market."

The ability of the Federal Reserve to withdraw its support from current Treasury-finacing operations depended to a great extent on the attitudes and policies of the Treasury. If the latter persisted in fixing low

rates on its issues, the Federal Reserve would either have to support them or risk being blamed for the failure of Treasury financing. In fact, however, the Treasury gradually adjusted its financing policies to the current monetary policies of the Federal Reserve and conscientiously tried to make the yields and other terms on its new issues such that they could be sold without Federal Reserve support. The Treasury's cooperation was sufficient to enable the Federal Reserve to adopt two more rules by the spring of 1953: ordinarily it would not buy any part of a new issue at the time of sale, and it would not buy at that time any outstanding issue of comparable maturity.[1]

Thus, by the spring of 1953, the Federal Reserve had moved far from its policies during the period before March, 1951, and had developed four rules that would "ordinarily" or "normally" be followed:

1. It would not deal in securities with maturities in excess of a year and would confine its open-market operations to short maturities, preferably bills.
2. It would not engage in swap operations.
3. It would not buy any new Treasury issue at the time of offering.
4. At the time of a new Treasury issue, it would not buy any outstanding securities of comparable maturity.

The Federal Reserve departed from these "normal" rules only twice during the first five years after their adoption. The first time was in late 1955, when the System was following a restrictive policy and the Treasury offered a large new issue with a maturity in excess of a year. The Treasury believed the issue had been made sufficiently attractive to enable all of it to be sold to private purchasers, but it soon became apparent that some of the issue would remain unsold. The Federal Reserve thereupon violated three of its rules all at once: It bought some of the new, longer-term issue and then sold some of its holdings of other maturities to mop up the reserves created by its purchases. The second departure occurred in July, 1958, after the dispatch of American troops to Lebanon following the revolution in Iraq. The prices of long-term governments, including prices on a recent issue, declined. Moreover, the Treasury had just announced a new issue, which was not finding purchasers in sufficient volume. The Federal Reserve intervened to purchase both some of the outstanding longer-term issue and some of the new issue. To mop up the reserves created by these purchases, it sold other maturities out of its portfolio.

These exceptions highlight two points. The fact that there were only

[1] This was not interpreted as preventing the Federal Reserve from taking a part of a new issue in exchange for its holdings of a maturing issue.

two exceptions to the "normal" rules in over five years indicates how far the Federal Reserve had moved away from the policies it had followed before March, 1951. It also indicates how far the Treasury, in its debt management policies, was willing to depart from its old objective of borrowing at continuously low interest rates and to move toward adjusting its policies to the economic-stabilization policies of the Federal Reserve. But these exceptions also highlight the fact that Federal Reserve policies cannot completely ignore federal debt management and that the problems of reconciling debt management and Federal Reserve policies directed toward economic stabilization could become even more serious in the future. It is not hard to imagine situations in which restrictive Federal Reserve policies to combat inflation might be seriously hampered by an unsympathetic Secretary of the Treasury faced with the problem of selling large new issues to meet maturing obligations and to cover current deficits.

The bills-only doctrine has been a controversial issue both within and outside the Federal Reserve System. While respecting the reasons for its adoption, its critics believe that, in refraining from dealing in long-term government securities, the System is failing to take advantage of a useful means of promoting economic stabilization. They contend that, by operating in the long-term market, the Federal Reserve could more quickly alter the supply of long-term funds and the behavior of long-term interest rates. For example, when it wished to ease the long-term market, it could tend directly to lower long-term rates by purchasing long-term securities, and it could tend directly to raise long-term rates by selling long-term securities. The advocates of the bills-only doctrine reply that the same results can be achieved through dealing exclusively in short maturities to regulate the reserve positions of banks. For example, the initial effect of purchasing bills and thereby increasing bank reserves may be to lower short-term rates. But as short-term rates fall, the various types of investors tend to shift their purchases to longer obligations, thereby reducing yields in that market. On the other hand, sales of bills that reduce bank reserves may first raise short-term rates, but the induced shift of funds away from the long-term market will raise yields there. Such arbitrage among the various maturities undoubtedly occurs. But critics of the bills-only doctrine question whether it is quick enough or extensive enough to meet the needs of economic stabilization.

Let us now see how the Federal Reserve has used the freedom that it gained in March, 1951, to use its powers more flexibly to promote economic stability and growth.

FEDERAL RESERVE POLICIES, MARCH, 1951, TO THE SPRING OF 1953

The rise of prices touched off by the Korean conflict ended in March, 1951, with the cost of living up 8 percent and wholesale prices up 19 percent from their levels prior to the outbreak. There followed a period of more than four years of relative price stability. In mid-1955, the consumer price index was only 3 percent above its level in March, 1951. The wholesale price index actually declined 6 percent. This reflected a fall in the prices of farm products and some rise in other wholesale prices. The period up to early 1953 was one of high production and employment. GNP rose from $329 billion in 1951 to $347 billion in 1952, and to an annual rate of $369 billion in the second quarter of 1953. Unemployment was at a minimum. Out of a total labor force of more than 66 million, unemployment averaged only 1.9 million in 1951 and 1.7 million in 1952. In the spring of 1953, it fell to the extraordinarily low level of 1.3 million.

Under these conditions, the Federal Reserve allowed interest rates to rise somewhat during the remainder of 1951 and in 1952. It took no action to reduce the volume of bank reserves, but as the demand for bank credit rose, it did not supply additional reserves by purchasing government securities. As a result, the excess reserves of member banks declined somewhat, and in 1952 member-bank borrowings were often above $1 billion, and, at times, rose to $1.5 billion. The prices of long-term government securities were about 4 percent below par by the end of 1952.

By early 1953, Federal Reserve officials began to fear a resumption of inflation. Prices had not begun to rise, but the economy was already operating at close to capacity levels, unemployment was at a minimum, demand was still rising, and Federal Reserve officials thought they detected a speculative building up of inventories. They therefore intensified their restrictive policy. For one thing, they allowed current gold exports and a reduction of Federal Reserve float to lower member-bank reserves by about $1 billion. Member-bank borrowings were kept above $1.2 billion during the first four months of the year. In January, the discount rate was raised from 1¾ to 2 percent, its highest level since 1934. Interest rates rose to their highest levels in 20 years and the prices of long-term Treasury obligations fell about 10 percent below par. Credit stringency became severe as expectations of still tighter money and even higher interest rates led lenders to withhold funds and borrowers to rush in to anticipate their future needs. In May, 1953, the Federal Reserve began to ease the situation. It now became evident that the immediate danger was not inflation, but recession.

EASY MONEY, 1953 TO 1954

The recession of 1953 to 1954 was short and relatively mild. GNP, at annual rates, declined from $369 billion in the second quarter of 1953 to $359 billion in the third quarter of 1954, a drop of 3 percent. This decline was entirely accounted for by a shift from inventory accumulation in early 1953 to inventory decumulation, and by an $11 billion decrease in federal expenditures for national security purposes. Other demands for output held up very well, and consumption expenditures actually rose about $4 billion. The latter was due, at least in part, to a $5 billion tax reduction at the beginning of 1954, and to the automatic decrease of tax collections and the automatic rise of transfer payments in response to the fall of GNP. The number of unemployed rose above its extraordinarily low level of 1.3 million in the spring of 1953, but it did not quite reach 3.5 million, or 5 percent of the labor force.

The Federal Reserve used all its major instruments to ease credit and to combat the recession. Early in May, 1953, it began to buy short-term government securities in the open market; by the end of June it had increased its holdings by nearly $1 billion. Though this action enabled banks to reduce their borrowings and to increase their excess reserves, it did not succeed immediately in lowering interest rates. This failure was, at least in part, because the financial community did not believe that the Federal Reserve had really reversed its tight-money policy and was working toward easier credit conditions. Open-market purchases had not proved to be an effective means of announcing the change of policy. It was partly for this purpose that the Board of Governors reduced member-bank reserve requirements against demand deposits at the beginning of July. Requirements against these deposits at central reserve city banks were decreased by two percentage points, and those at other member banks by one percentage point. This freed about $1.2 billion of reserves. The System then bought an additional $500 million of government securities, bringing the total increase since April to $1.5 billion.

The combined effect of these actions was to ease member-bank reserve positions markedly. By November, 1953, member-bank borrowings had fallen from their high level of about $1.2 billion in the early months of the year to about $500 million; excess reserves had risen from around $500 million to $700 million. In February, 1954, all the Reserve banks lowered their discount rates from 2 to 1¾ percent and in April reduced them to 1½ percent.

In June and July, 1954, the Board again lowered member-bank reserve requirements. This time it reduced requirements against time deposits by

one percentage point and requirements against demand deposits by two percentage points in central reserve cities and one percentage point at other member banks. This freed more than $1.5 billion of reserves. Simultaneously, however, the Federal Reserve absorbed about $1 billion of these released funds by selling government securities.

By mid-1954 credit conditions were very easy. Member-bank borrowings were less than $200 million, and excess reserves were above $800 million. The money supply had risen about $3 billion during the preceding year. It rose another $6 billion during the latter half of 1954. Interest rates, which had fallen during 1953, declined still further. The yield on Treasury bills fell below ¾ of 1 percent. The prices of long-term government securities again rose above par.

This easy-money policy almost certainly helped shorten the recession, reduce its severity, and hasten recovery. It was especially helpful in stimulating residential construction. Expenditures for this purpose, which had been $11.1 billion in 1952 and $11.9 billion in 1953, rose to annual rates of $14 billion in the third quarter of 1954 and $15.9 billion in the first quarter of 1955.

Some Federal Reserve officials later wondered whether they had not eased credit too much, continued the easy-money policy too long, and provided both the public and the banking system with too much liquidity. Between the initiation of the easy-money policy in May, 1953, and the end of 1954, the public's money supply increased from $125 billion to $134 billion, a rise of 7.2 percent. Commercial banks were also put in a much more liquid condition. For one thing, they had been enabled to reduce their borrowings from $1.2 billion to $400 million and to increase their excess reserves from $500 million to $800 million. In addition, they had increased their holdings of government securities by more than $10 billion, and many of these were short-term obligations that could be sold quickly and with little loss by the banks. This greatly enhanced liquidity of both the public and the banks contributed to the subsequent rise of spending and prices. But it does not necessarily follow that the policies of 1953 to 1954 were too easy and too prolonged. Perhaps the error was in not moving more aggressively as business recovery approached an inflationary stage.

TIGHT MONEY, 1955 TO 1957

The recession reached its trough in the second quarter of 1954, and was followed first by recovery and then by a boom that culminated in the third quarter of 1957. During this three-year period GNP at current

prices rose \$86.7 billion or 24.2 percent. Unemployment, which was about 3.4 million in mid-1954, averaged 2.6 million in 1955 and 1956 and fluctuated around this level during the first ten months of 1957. This represented less than 4 percent of the labor force.

Table 23-1 shows that increases in all the major categories of spendings

TABLE 23.1 GNP and Its Components, 1954-1957
(at annual rates in billions)

	Second Quarter 1954	1955	1956	Third Quarter 1957
GNP—Total	\$358.9	\$397.5	\$419.2	\$445.6
Personal consumption	236.5	256.9	269.4	288.3
Gross private domestic investment	47.2	63.8	68.2	66.7
Net foreign investment	− 0.4	− 0.4	1.3	3.6
Government purchases of goods and services, total	75.5	77.1	80.3	87.0
Federal	48.3	46.8	47.1	50.9
State and local	27.3	30.3	33.1	36.1

SOURCE: *Survey of Current Business*, July, 1958, pp. 5, 15.

for output contributed to the rise of GNP. In view of the widespread complaints against the Federal Reserve's "excessively restrictive" credit policy, it is interesting to note that spendings for gross private domestic-investment purposes rose more than 40 percent during the three years following the third quarter of 1954, and that state and local expenditures, some of which were financed with borrowed money, rose 32 percent. Investable funds became "scarce," not because their supply was reduced, but because the demand for them increased markedly.

Prices remained stable until mid-1955 and then began to rise, slowly at first, and then more rapidly. By October, 1957, consumer prices had risen 5.6 percent and wholesale prices 6.6 percent.

The Federal Reserve began to reduce the degree of credit ease as business activity started upward in the latter part of 1954, and then permitted tighter credit conditions to develop during the period from early 1955 to November, 1957. Its policy during this period may be characterized as almost purely defensive rather than aggressive. That is, it did not attempt to reduce the money supply despite the fact that the latter had risen more than 7 percent in the year and a half preceding 1955. Instead, it merely held the money supply approximately constant, and refused to allow it to expand in response to increases in the demand

for it. The 24 percent rise of GNP expenditures was financed almost entirely by an increase in the income velocity of money. And the rise of interest rates was due largely to the sharp rise in the demand for investable funds while the money supply was not permitted to rise.

TABLE 23–2. The Money Supply and Its Direct Determinants, 1954–1957
(In billions)

	December 31, 1954	October 31, 1957	Change, 1954–1957
SOURCES			
Monetary gold stock	$ 21.7	$ 22.7	+$ 1.0
Treasury currency outstanding	5.0	5.1	+ 0.1
Federal Reserve credit	25.3	24.1	− 1.2
Commercial-bank credit			
Loans	70.6	93.0	+ 22.4
U.S. government securities	69.0	57.3	− 11.7
Other securities	16.3	17.6	+ 1.3
Total sources	$207.9	$219.8	+$11.9
Minus: COMPETING USES			
U.S. government cash and deposits	$ 5.9	$ 4.8	−$ 1.1
Foreign deposits, net	3.3	3.3	..
Time deposits	46.8	55.5	+ 8.7
Other accounts (net)	17.4	21.2	+ 3.8
Total competing uses	$ 73.4	$ 84.8	+$11.4
Equals: THE MONEY SUPPLY			
Demand deposits	$106.6	$107.2	+$ 0.6
Currency outside banks	27.9	27.8	− 0.1
Total money supply	$134.5	$135.0	+$ 0.5

Let us now see more specifically what the Federal Reserve did during this period. It did not raise member-bank reserve requirements at all. Its most aggressive action was in the first part of 1955, when it sold over $1 billion of government securities, thereby forcing the banks to borrow more heavily and to draw down their excess reserves in order to support the existing money supply. Member-bank borrowings, which had averaged less than $200 million for several months after July, 1954, averaged about $800 million during this period. In the last part of the period, they were close to $1 billion. And the excess reserves of member banks fell from $800 million to about $500 million. Federal Reserve discount rates, which had been lowered to 1½ percent in April, 1954, were raised to 1¾

percent in April, 1955, and then in six more steps to 3½ percent. The last increase, which occurred in August, 1957, brought these rates to their highest level since 1932.

TABLE 23–3. Member-Bank Reserves and Related Items, 1954–1957 (averages of daily figures, in billions)

	December, 1954	October, 1957	Change, 1954–1957
SOURCES			
Federal Reserve credit			
U.S. government securities	$24.9	$23.4	−$1.5
Discounts and advances	0.4	0.8	+ 0.4
Float	1.0	1.1	+ 0.1
Total Federal Reserve credit	26.3	25.3	− 1.0
Monetary gold stock	21.7	22.7	+ 1.0
Treasury currency	5.0	5.1	+ 0.1
Total sources	$53.0	$53.1	+$0.1
COMPETING USES			
Money in circulation	$30.8	$31.1	+$0.3
Treasury cash and deposits at Federal Reserve	1.2	1.3	+ 0.1
Foreign deposits at Federal Reserve	0.4	0.3	− 0.1
Other deposits at Federal Reserve	0.4	0.3	− 0.1
Other Federal Reserve Accounts	0.9	1.1	+ 0.2
Total competing uses	$33.7	$34.1	+$0.4
MEMBER-BANK RESERVES	$19.3	$19.0	−$0.3
Addenda:			
Required reserves	18.6	18.6	0.0
Excess reserves	0.7	0.5	− 0.2

This combination of a defensive Federal Reserve policy and the investment boom, which increased greatly the demand for investable funds, raised market rates of interest to their highest levels in 25 years.

We have already seen that these increases in interest rates did not prevent investment expenditures from rising more than 40 percent, that Federal Reserve policies did not prevent total expenditures for output from rising 24 percent, and that they did not prevent the cost of living from rising 5.6 percent and wholesale prices 6.6 percent. Does this prove, as some have asserted, that monetary policy cannot stop inflation? We shall not at this point speculate on the probable effects of a more aggressively restrictive policy, but a few comments on the actual events and policies of the period may be enlightening. In the first place, one should

not expect a rise of interest rates to prevent a rise of investment expenditures when the rise of rates is itself produced by an upward shift of the investment-demand schedule. The marginal efficiency of the investment

TABLE 23–4. Market Yields, 1954–1957
(In percentages)

Average for Period	3-Month Treasury Bills	Long-Term Treasury Bonds	Corporate Bonds, AAA Quality
1954	0.94	2.55	2.90
1955	1.75	2.84	3.06
1956	2.66	3.08	3.36
Oct., 1957	3.60	3.73	4.10

schedule undoubtedly shifted sharply upward during this period, so that spenders for investment purposes were willing to spend much more at each level of interest rates or to spend the same amounts at much higher levels of interest rates. An actual rise of investment expenditures could have been prevented only by a sharp decrease in the supply of investable funds at each interest rate, and this did not occur.

In the second place, it would be unreasonable to expect that a policy of holding the money supply stable in the face of a sharp rise of investment-demand schedules would succeed in preventing a rise of either investment spending or GNP. An induced rise of interest rates and the apparent "scarcity" of money almost inevitably lead some members of the community to find ways of "economizing" on their money balances—of holding smaller balances relative to their expenditures. This is especially true if the community enters the boom period with abnormally large balances relative to its current expenditures. We noted earlier that increases of interest rates were likely to reduce the quantity of money balances demanded. In practice, this economizing of money balances can occur in several ways, of which the following are examples:

1. Households, enticed by higher interest rates and perhaps also by advertising campaigns by financial institutions, surrender some of their idle L_2 balances in exchange for securities or for claims against financial institutions, thereby making these balances available for L_1 purposes.

2. Business firms may do the same. For example, they may surrender money balances that they do not expect to spend in the near future and hold Treasury bills instead. Moreover, faced by higher interest rates on their own borrowings or by an unavailability of credit, they may maintain their expenditures by drawing down their money balances.

Commercial banks played a role in this process of activating idle balances or speeding up the income velocity of money. Table 23–2 showed that, between the end of 1954 and the end of October, 1957, commercial banks reduced their holdings of Treasury obligations by $11.7 billion. Many of these sales were of shorter-term, highly liquid securities. The buyers of these securities paid for them by drawing down their deposit accounts, which lowered the required reserves of banks and enabled banks to expand their loans and holdings of other securities by an amount equal to the value of the Treasury securities that they had sold. Such transactions need not increase either the total supply of investable funds or the average velocity of money. For example, the buyers of Treasury obligations from the banks may pay for them with current savings, which would in any event have been made available for use. In this case, the commercial banks merely act as intermediaries in transmitting current saving into investment. But the evidence indicates that, in this period, many of the Treasury obligations sold by the banks were paid for, not with current savings but by relinquishing money balances (mostly deposits) that were previously idle. Thus, the buyer gave up an idle deposit balance and enabled the banks to create for borrowers the deposits that would be spent, at least in the first instance.

In short, a purely defensive policy of holding the money supply constant should not ordinarily be expected to prevent actual increases of investment expenditures and GNP in the face of upward shifts of investment-demand schedules, for the induced rise of interest rates will lead to an economizing of money balances relative to expenditures—to a rise of expenditures relative to money balances. But, in principle at least, the Federal Reserve could have reduced the money supply enough to offset any unwanted effects of increases in the income velocity of money.

EASY MONEY, NOVEMBER, 1957 TO JULY, 1958

In November, 1957, the Federal Reserve relaxed its restrictive policy and again moved toward credit ease. For several months, the various economic indicators had presented a confusing pattern. Several suggested a continuance of the boom and of price increases. GNP had increased from quarter to quarter, unemployment in October was at its lowest level in many months, and both the consumer price index and the wholesale index set a new high record almost every month. On the other hand, several indicators suggested that the boom was losing its vigor and might soon give way to recession. Industrial production had been falling for several months. The rate of growth of GNP was declining, as was also the

rate of price increases. Late in the autumn, both official and private surveys revealed that business expenditures for plant and equipment, which had been at unprecedented levels in 1956 and the first three quarters of 1957, would begin to decline in the fourth quarter and would continue to fall through 1958.

The boom reached its peak in the third quarter of 1957 and gave way to recession. By the first quarter of 1958, GNP had fallen nearly $20 billion, or about 4.5 percent. This decline was slightly greater than those in the recessions of 1949 and 1953 to 1954. Unemployment, which had been 2.5 million in October, averaged above 5.1 million in the first quarter of 1958. Changes in business-inventory policies were a major contributor to the recession. In the third quarter of 1957, business was adding to its inventories at an annual rate of $2.2 billion; in the first quarter of 1958 it reduced its inventories at an annual rate of $9.5 billion. This shift accounted for $11.7 billion of the decline of GNP. But as so

TABLE 23–5. GNP and Its Components, 1957–1958
(seasonally adjusted annual rates in billions of dollars)

	Third Quarter 1957	First Quarter 1958	Change, Third Quarter 1957–First Quarter 1958
GNP, Total	$445.6	$425.8	−$19.8
	288.3	286.2	− 2.1
Gross pr	66.7	49.6	− 17.1
struction (nonfarm)	16.9	17.1	+ 0.2
Other construction	19.7	19.2	− 0.5
Producers' durable equipment	28.0	22.9	− 5.1
Net change in business inventories	2.2	− 9.5	− 11.7
Net foreign investment	3.6	0.5	− 3.1
Government purchases of goods and			
	87.0	89.5	+ 2.5
Federal	50.9	50.9	..
State and local	36.1	38.6	+ 2.5

often happens, the shift in business inventory policy was induced at least in part by more basic changes in the economy. For one thing, the predicted decline of business expenditures for plant and equipment began. For another, federal-procurement policies in the autumn shifted expectations. Perhaps partly to combat inflation, but more for the purpose of holding its expenditures within the total budgeted for the fiscal year and to avoid raising the debt limit, the federal government sharply reduced its new orders for military equipment, reduced its progress payments for

military equipment in process of production, and suggested to many firms that they stretch out their production over a longer period. Moreover, net foreign investment fell, largely because of a decrease in the foreign demand for United States exports. Personal consumption expenditures held up remarkably well, declining less than 1 percent. This was in large part because of the automatic decline of tax liabilities and the automatic rise of unemployment compensation and other transfer payments that bolstered disposable personal incomes.

It was under these conditions that the Federal Reserve relaxed credit restriction and moved toward easy money. In October, 1957, its open-market policy was designed to avoid a further tightening of the market and to ease it slightly. The first decisive move came in mid-November, when discount rates were reduced from 3½ to 3 percent. Market rates of interest, and especially long-term rates, immediately fell sharply. The Open-Market Committee cautiously purchased government securities to enable banks to reduce their borrowings and increase their excess reserves, as is shown in Table 23–6.

TABLE 23–6. Member-Bank Borrowings and Excess Reserves, 1957–1958 (averages of daily figures, in millions of dollars)

	Borrowings	Excess Reserves	Net Borrowed Reserves (Member-Bank Borrowings Minus Excess Reserves)	Net Free Reserves (Excess Reserves Minus Borrowings)
July, 1957	$ 917	$534	$383	
August	1005	534	471	
September	988	522	466	
October	811	467	344	
November	804	512	292	
December	710	577	133	
January, 1958	451	573		$122
February	242	567		325
March	138	633		495
April	130	623		493
May	119	666		547

SOURCE: *Federal Reserve Bulletins.*

In February, March, and April the Board of Governors lowered member-bank reserve requirements against demand deposits in several steps. The total reductions were 2 percentage points for central reserve city banks, 1½ for reserve city banks, and 1 for country banks. The effect was

to lower required reserves by about $1.4 billion. These actions, together with those in the open market, enabled member banks to reduce their borrowings and to increase their excess reserves. By March, their excess reserves exceeded their borrowings by nearly $500 million, almost the reverse of the situation during the period of credit restriction. The Reserve banks lowered their discount rates three more times, bringing them down to 1¾ percent in mid-April.

These liberalizing Federal Reserve actions were accompanied by a sharp decline of short-term interest rates. The yield on Treasury bills, which had averaged about 3.6 percent in October, had fallen well below 1 percent by May. Long-term rates proved less responsive. After dropping sharply immediately after the first reduction of discount rates in mid-November, they began to drift downward much more slowly, and by May had begun to rise. The very easy conditions prevailing in the short-term credit market were not evident in the long-term market, for which there were several reasons. One was the extraordinarily large volume of new, long-term bond issues. State and local governments borrowed heavily, both to finance current expenditures and to retire short-term debt issued during the period of high interest rates. So did corporations. The federal government also floated several long-term issues, primarily to retire short-term debt. This became a highly controversial matter, for many believe that, in periods of recession, the Treasury should borrow only on short-term obligations and should refrain from issuing long-term securities that would compete with private long-term issues and tend to decrease the availability and increase the cost of long-term credit for private investment. These heavy borrowings in the long-term market while short-term loans were being repaid help to explain the disparity in the behavior of short-term and long-term interest rates. Some observers insisted that this was an occasion when the Federal Reserve should abandon the bills-only doctrine and buy long-term securities. A majority of Federal Reserve officials rejected this view.

TIGHT MONEY AGAIN, 1958 TO 1959

The recession that started in the third quarter of 1957 proved to be shorter than many had expected, and it reached its low point in April, 1958. The economy then began a recovery that continued until the second quarter of 1960. GNP had risen 13 percent by the fourth quarter of 1959, and 17 percent by the second quarter of 1960. However, this turned out to be the weakest recovery in the postwar period. Demands for output and actual output failed to rise as fast as the productive

capacity of the economy. Unemployment, which had claimed 7.4 percent of the labor force in February, 1958, did decline to 4.9 percent by mid-1959, but thereafter rose somewhat. During the last half of 1959 and first half of 1960, it averaged 5.5 percent.

TABLE 23–7. Gross National Product of the United States During Selected Periods, 1958–1959
(In billions of dollars at annual rates)

	First Quarter 1958	Fourth Quarter 1959	First Quarter 1960	Second Quarter 1960	Third Quarter 1960
Total GNP	$432.9	$488.5	$501.7	$504.8	$503.7
Personal consumption	287.4	318.8	323.9	329.9	329.8
Gross private domestic investment	53.9	73.2	79.1	73.5	70.3
Net exports of goods and services	1.7	.0	1.4	2.4	2.8
Government purchases	89.8	96.5	97.2	99.0	100.8

Thus, this "prosperity" period was characterized by a level of unemployment comparable to the levels that prevailed during the recessions of 1949 and 1954. There were widespread complaints about the slow rate of economic growth in the United States relative to growth rates abroad. The weakness of the recovery was reflected in stability of prices. The wholesale price index rose not at all, and the consumer price index rose only 1.5 percent from early 1958 to the end of 1959. Nevertheless, fears of inflation were widespread. The almost uninterrupted rise of prices for nearly 20 years, and the failure of prices to decline in the 1957 to 1958 recession convinced many that we were in danger of adopting inflation as a way of life.

It was largely because of fear of inflation that the Federal Reserve abandoned its easy-money policy in May, 1958, and initiated a restrictive policy that was to permit interest rates to rise to their highest levels in 30 years. By December, 1959, when rates reached their peak, yields on 90-day Treasury bills were around 4½ percent; those on 9- to 12-month Treasury issues, about 5 percent; and those on long-term federal issues, about 4.27 percent. In broad outline, Federal Reserve policy during this period was quite similar to that during the 1955 to 1957 boom. The Federal Reserve did not attempt to reduce the money supply; it only followed a policy of "leaning against the wind," of preventing the money supply from increasing in response to the rising demand for money balances. Large gold outflows of about $2.6 billion dollars between the

TABLE 23–8. Selected Short-Term Interest Rates in the United States, 1958–1960
(In percent yield per annum)

Period	Discount Rate at Federal Reserve Bank of New York (end of month)	3-Month Treasury Bills	9–12 Month Treasury Issues	U.S. Long-Term Bonds
April, 1958	1¾	1.30	1.35	3.12
May, 1958	1¾	1.13	1.21	3.14
Aug., 1958	1¾	1.69	2.14	3.60
Nov., 1958	2	2.63	2.83	3.70
Mar., 1959	3	2.80	3.56	3.92
May, 1959	3½	2.84	3.92	4.08
Sept., 1959	4	4.04	4.80	4.26
Dec., 1959	4	4.49	4.98	4.27
Jan., 1960	4	4.35	4.93	4.37
Feb., 1960	4	3.96	4.58	4.22
Mar., 1960	4	3.31	3.93	4.08

SOURCE: *Federal Reserve Bulletins.*

end of April, 1958, and the end of 1959 tended to reduce bank reserves. A large part, but not all, of these reserves losses were offset by Federal Reserve purchases of securities. As shown in Table 23–9, total member-bank reserves remained almost unchanged during the period. However, banks were able to maintain their reserves at this level only by increasing markedly their borrowings from the Federal Reserve from about \$119 million in May, 1958, to more than \$900 million in the last part of 1959. The free-reserve position of banks also changed markedly. In April to May, 1958, banks had net free reserves of about \$500 million. By the last part of 1959, the decline of their excess reserves and increase of their borrowings from the Federal Reserve put banks in a position of having net borrowed reserves of more than \$400 million. Such, in broad outline, was the open-market policy of the Federal Reserve. As in the earlier period of restriction, the Federal Reserve did not raise member-bank reserve requirements, but it raised its discount rate four times, elevating it from 1¾ percent in the spring of 1958 to 4 percent in September, 1959.

In the summer of 1958, the Federal Reserve again departed from its "normal" rules for open-market operations, to prevent disorderly declines in the prices of long-term government securities. The market for long-term bonds had shown signs of weakness for several weeks. One reason for this was the very large volume of long-term government and private issues during the first months of the year as long-term rates fell

TABLE 23-9. Reserve Positions of All Member Banks on Selected Dates, 1958-1960
(in millions of dollars)

Period	Total Reserves Held	Required Reserves	Excess Reserves	Member-Bank Borrowings at the Federal Reserve	Net Free Reserves
April, 1958	$18,394	$17,772	$623	$130	$493
May, 1958	18,194	17,543	651	119	532
Aug., 1958	18,580	17,946	635	252	383
Nov., 1958	18,540	18,034	506	486	20
Mar., 1959	18,429	17,968	460	601	− 140
May, 1959	18,580	18,132	448	767	− 318
Sept., 1959	18,593	18,183	410	903	− 493
Dec., 1959	18,932	18,450	482	906	− 424
Jan., 1960	18,878	18,334	544	905	− 361
Feb., 1960	18,213	17,758	455	816	− 361
Mar., 1960	18,027	17,611	416	635	− 219

SOURCE: *Federal Reserve Bulletins.*

below what were considered "normal" levels. Another was the almost unexpected and early end of the recession, which led many to expect higher interest rates in the near future. Still another reason was widespread speculation in a recent long-term issue. Then came the dispatch of United States troops to Lebanon, which led to a sharp decrease in private demands for long-term obligations. On July 18, 1958, the Federal Reserve announced tersely that it would "buy Treasury securities other than short-term securities." This announcement, together with very small purchases of the long-term obligations, was sufficient to restore order in the market, and the Federal Reserve quickly withdrew. But soon thereafter the Treasury faced current financing problems. It feared that private buyers would not take all of a $13.5-billion, August 1 issue of one-year 1⅝ percent certificates of indebtedness. The Federal Reserve purchased enough of these to assure the success of the issue. At the same time, it sold enough of its other holdings to prevent an easing of the reserve position of the banks. After this episode it returned to its "normal" rules of open-market operations.

As already indicated, the peak of interest rates was reached around the end of 1959. The Federal Reserve then began a cautious relaxation, largely because of the high level of unemployment. In the summer of 1960, as a new recession loomed, the Federal Reserve began to move more positively toward an easy-money policy. Then it was faced by

an unhappy fact: Even the United States could have its freedom of action limited by considerations related to balance-of-payments and international-reserve positions.

CONCLUSIONS

The period of a little more than nine years—extending from the Treasury-Federal Reserve accord in March, 1951, to the summer of 1960, when we began to be faced with international obstacles to our freedom of monetary action—will long stand out in the history of the development of Federal Reserve policies. At the beginning of the period, the Federal Reserve had not followed a restrictive policy in more than 17 years. For more than nine years its overriding objective, greatly limiting its freedom to promote others, had been that of preventing increases in interest rates on long-term government securities. Now it was free to elevate other objectives and to develop new ways of using its control instruments. But, when it regained this freedom, conditions were far different from those of the 1920s and early 1930s. One change was the great growth of the national debt, which could not be ignored completely. Another was symbolized by the Employment Act of 1946: The nation was now determined not only to avoid serious depressions, but also to maintain continuously "maximum employment, production, and purchasing power." Greater awareness of growth possibilities led to demands for "the highest sustainable rate of economic growth," and the public was becoming increasingly annoyed by the upward trend of the price level.

Objectives

It was under these conditions that the Federal Reserve worked out new relationships with the Treasury's debt-management policies and sought new patterns of flexible, anticyclical monetary policies. The two recessions of 1953 to 1954 and 1957 to 1958 were countered with expansionary monetary policies. The booms and threatened inflations of 1952 to 1953, 1955 to 1957, and 1958 to 1959 invoked monetary restriction, which consisted mainly of limiting increases in the money supply in the face of rising demands. The period was characterized by widespread controversies, especially during times of restriction.

Many of these controversies concerned the nation's multiple economic objectives. To what extent is the objective of price-level stability compatible with those of promoting continuously high levels of employment and the highest sustainable rate of economic growth? And to the degree

that they are incompatible, which should be promoted and which sacrificed? In the answers to both questions, there were widespread disagreements. One reason for these disagreements is the difficulty of determining how much of one objective we can gain by a given sacrifice of another. Economists generally agree that, when money wage rates and prices are inflexibly downward, price deflation is inconsistent with the maintenance of high levels of employment and output and that rapid price inflation is likely to add little or nothing to output. But within these limits, there is wide disagreement. Some insist that maximum employment and output can be achieved only if the price level of output is allowed to rise slowly but continuously at a rate of 2 or 3 percent a year. Others claim that this is a short-sighted view, and that output will average higher over a longer period if price levels are kept stable. In addition, there are continuing arguments over the harmfulness of continuing price increases because of their effects on the distribution of wealth and income.

Causes of Inflation

Much of the disagreement as to the causes of modern peacetime inflations arises out of differing theories. Some economists distinguish between what they call "demand-pull" and "cost-push" types of inflation. Demand-pull inflations are those that occur as rising demands for output raise the prices of output, pull up employers' demand schedules for labor and other productive factors, and in effect pull up wages and the prices of other factors of production. This type of inflation, it is contended, can be dealt with satisfactorily by conventional monetary and fiscal policies. By preventing the emergence of excess demands for output, these instruments can eliminate the causes of both price increases and inflationary types of wage increases. And they may do so at little or no cost in terms of output and employment.

Cost-push types of inflation, it is argued, are very different phenomena. These result from a combination of autonomous wage increases enforced by union demands and administered price policies by industries with strong monopoly power. Even in the midst of a considerable amount of unemployment, labor unions may insist on wage increases considerably in excess of increases in productivity, thereby raising cost schedules. Employers, with some previously unutilized monopoly power, then raise their prices at least enough to offset the rise of their labor costs. In effect, they will supply each amount of output only at higher prices. Faced with this market situation, the monetary and fiscal authorities have only two choices:

1. They may follow policies that will permit demands for output to rise sufficiently to maintain output and employment despite the rise of prices. In this case, they will in effect validate the autonomous wage and price increases and create conditions favorable to another round.

2. They may refuse to allow demands for output to rise. In this case, both output and employment must fall. Moreover, the restriction of demand will not prevent prices from rising. Thus, it is argued, conventional fiscal and monetary policies that operate by restricting demand are not only ineffective in preventing price increases, but they also reduce output and employment.

It is easy to show that many have overdrawn the distinction between demand-pull and cost-push elements in price inflation. In practice, they are often difficult to distinguish because inflationary periods are usually characterized by both rising demands for output and aggressive union demands and rising wage rates. Whether one concludes that prices or wages rose first often depends on the selection of the base date. Moreover, it is clear that both the size of union wage demands and the resistance of employers to such demands depend at least in part on their estimates of the future behavior of demand for the employers' output. A restriction of demands for output can temper union wage demands and stiffen employers' opposition to them.

Even though the cost-push arguments are often exaggerated and wage demands are unrealistically considered to be completely independent of demands for output, these arguments cannot be dismissed. It may indeed turn out that wage demands in excess of increases in average output per manhour and the willingness of employers to grant such demands are so unresponsive to the state of demand for output that they can be held in check only by amounts of unemployment currently considered unacceptable. If this turns out to be the case, the nation will face three choices:

1. To follow fiscal and monetary policies liberal enough to maintain employment and output despite wage and price increases, thereby almost inevitably encouraging such increases.
2. To refuse to allow demands for output to rise enough to offset such wage and price increases and to maintain enough unemployment to end the upward spiral, even though this turns out to require more unemployment than is currently considered acceptable.
3. To intervene in the wage- and price-making processes to prevent the emergence of excessive wage increases and excessive price increases by firms with monopoly power. To do this effectively would probably require much more detailed intervention by the government than most Americans like to contemplate.

Fiscal Policies

Conflicts of values and objectives also pose problems for the use of government fiscal policies for general stabilization purposes. The automatic variations of government revenues and expenditures have proved to be highly useful in reducing the breadth of fluctuations. In both the 1953 to 1954 and the 1957 to 1958 recessions, the automatic decline of tax collections and the automatic rise of government transfer payments served to bolster disposable private incomes and private demands for output. Flexibility of the opposite type probably helped to limit the rise of private demands during the 1955 to 1957 boom. Experience with respect to changes in the government's tax and expenditure programs has been less reassuring. The $5 billion decrease of taxes at the beginning of 1954 helped combat that recession. However, governmental processes for changing tax and expenditure programs are so slow, and preplanning is so limited, as to make unlikely the use of these instruments in the early stages of a recession or depression. It seems likely that monetary policy, along with the automatic variations of government revenues and expenditures, will be the principal defenses used in the early stages of recession. Changes in tax and expenditure programs may, of course, come later.

Prospects for a timely and aggressive use of tax increases and of decreases in government expenditure programs to combat inflationary pressures are even less promising. Tax increases are delayed and limited not only by the time-consuming tax-making process and the inevitable wrangles over the question of who should pay the additional taxes, but also by a widely held theory that tax rates are already so high that further increases would do irreparable harm to incentives and productivity. The fact that this hypothesis is not supported by such studies of it as have been made does not reduce its persuasiveness with legislators and government officials. Because of the strength of these forces, it will be difficult indeed to secure tax increases to fight inflation unless the rise of prices becomes rapid or prolonged. Reductions of government-expenditure programs for this purpose are difficult to achieve because of the values attached to individual projects. There is a strong tendency to argue that every program is of such substantive importance that it cannot be curtailed or postponed.

These limitations on the timeliness and aggressiveness of fiscal policy measures leave a major role for monetary policy in promoting economic stabilization. Monetary policy is likely to have to bear a major part of the burden during the early stages of recession or depression; in fighting in-

flation, it may get little help in the form of tax increases or decreases of government expenditures unless the inflation is rapid or prolonged. But the aggressive use of monetary restriction to combat inflation also encounters active opposition. Much of this is because of its alleged drag on output, employment, and economic growth. However, during the 1955 to 1957 period of credit restriction, critics laid great stress on the alleged uneven impact of credit restriction on the various classes of borrowers. The Federal Reserve was not held directly responsible for this; it merely limited the total supply of credit and left the task of allocation and rationing to market processes. However, critics alleged that private lenders discriminated against some types of borrowers. Those who allegedly suffered most were those who borrowed for housing purposes, state and local governments, and small business. Housing credit was sharply curtailed, largely because of the policies of the FHA and the VA relative to the maximum interest rates that might be charged on mortgages insured by them. As interest rates on all other kinds of securities rose, these agencies raised the allowable rates on insured mortgages only belatedly and inadequately. As a result, the flow of money into insured mortgages declined markedly. This situation could have been remedied easily by raising or eliminating the ceiling on allowable interest rates. Borrowing costs for state and local governments, including school authorities, rose sharply. This was partly because of the general rise of interest rates and partly because the great increase in the total supply of tax-exempt state and local securities during the postwar period raised yields on them relative to yields on taxable obligations. Did small and medium-sized business firms suffer from unfair discrimination? This charge has been neither proved nor disproved. But if it is true, the best remedy would seem to be a reform of the private lending and credit-rationing mechanism rather than the maintenance of such a huge supply of credit that there will be enough for everybody no matter how large the total demand may be.

A major purpose of fiscal and monetary policies aimed at promoting economic stability is to regulate the behavior of the community. In recession it is to entice the community to spend more for output. In times of actual or threatened inflation it is to restrict spending. This cannot be achieved without restricting somebody, and one who is restricted from doing what he wants to do is not always properly appreciative. Some of those who listen with such sympathy to the complaints of everyone who is restricted by fiscal and monetary policies would do well to ponder the consequences of eliminating all such restraints.

Effectiveness of Monetary Policy

This period also witnessed widespread debates about the effectiveness of monetary policy as a device for regulating the rate of expenditures for output. Little new was added concerning the ability of an expansionary monetary policy to limit and reverse an unwanted decrease in expenditures for output. But now many writers came to question the ability of a restrictive monetary policy to limit increases in demands for output. The general argument was that limiting increases in the money supply in the face of rising demands for money balances for transactions purposes, or actual decreases of the money supply, would simply raise interest rates a bit, and that this would induce the community to economize on money balances, that is, to raise the income velocity of money.

As a background for evaluating these arguments, let us review briefly the recent history of the behavior of the income velocity of money in the United States. In the late 1920s, the income velocity of money ranged between 3.7 and 3.9 per year. The community was demanding to hold money balances equal to about 25.5 to 27.0 percent of GNP. From that point, income velocity fell sharply during the depression, and still further during World War II, when private expenditures were repressed by shortages of goods and services, together with price ceilings and rationing. Thus, in 1946, income velocity was only 1.99, or about 50 percent below its level in the late 1920s. Since that time it has shown a marked upward trend. By 1957, it had reached 3.29, and in 1962 it was 3.79, approximately the level of the late 1920s. A close study of Table 23–10 reveals that it fell in only two years (1954 and 1958) and then only slightly.

This upward trend over a period of more than 15 years raises important questions:

1. Why has it taken so long for income velocity to rise back toward its level of the late 1920s, for the community to decrease the quantities of balances demanded relative to GNP? To this question there is no really complete answer. The persistence of relatively low interest rates for a considerable period after the war provides only a part of the answer.

2. Why has this upward trend occurred? The upward trend of interest rates is clearly relevant and is probably an important force. But it is by no means the whole answer. The demand-for-money-balances function appears to have shifted to the left; that is, smaller balances are demanded at each level of interest rates. One reason for this is the greater availability, and greater public knowledge, of a wide range of close-money

substitutes: time deposits, savings and loan shares, Treasury bills, and so on. Then there is the "corporate treasurer's revolution"; financial officers of corporations have become much more alert and have found many ways of economizing their cash balances by holding other liquid assets.

TABLE 23–10. United States Money Supply Relative to Gross National Product (amounts in billions of dollars)

Period	Gross National Product	Money Supply	Income Velocity of Money (GNP ÷ the money supply)	Money Supply as a Percent of GNP
1946	$210.7	$106.0	1.99	50.3
1947	234.3	109.2	2.15	46.6
1948	259.4	109.8	2.36	42.3
1949	258.1	108.7	2.37	42.1
1950	284.6	111.6	2.55	39.2
1951	329.0	116.9	2.81	35.6
1952	347.0	123.0	2.82	35.4
1953	365.4	126.0	2.90	34.5
1954	363.1	127.8	2.84	35.2
1955	397.5	132.3	3.00	33.3
1956	419.2	133.7	3.14	31.9
1957	442.8	134.4	3.29	30.4
1958	444.5	135.9	3.27	30.6
1959	482.7	140.6	3.43	29.1
1960	503.4	140.3	3.59	27.9
1961	518.7	142.5	3.64	27.5
1962	553.9	146.0	3.79	26.4

Many of them have become major suppliers of funds in almost all branches of the open market for short-term obligations. Having discovered these methods, they are unlikely to abandon them unless interest rates fall to extremely low levels. Households have also discovered many methods of economizing on cash balances: by paying off some of their outstanding debts, by relying more heavily on charge accounts and other forms of consumer credit, by holding various forms of savings accounts, and so on. They, too, are unlikely to reverse these practices if interest rates stay above very low levels.

Such an upward, secular trend of velocity need not reduce at all the effectiveness of monetary policy. It requires only that the monetary authorities increase the money supply at a slower rate. But cyclical fluctuations of velocity—increases in boom periods and declines in recessions—can be more troublesome. Especially in the 1955 to 1957 period of re-

striction, many claimed that a cyclical rise of velocity was being induced by the rise of interest rates, which, in turn, was traceable in considerable part to restriction of growth of the money supply.

Critics stressed the role of nonbank financial intermediaries, such as savings-and-loan associations, mutual savings banks, and time and savings deposits at commercial banks. They claimed that the availability of these close-money substitutes made the demand for money balances much more elastic or responsive to interest rates. Even relatively small increases of interest rates on these claims, while money itself yielded no explicit return, would induce people to decrease their holdings of money balances and make the funds so released available for spending and lending. In other words, the very restriction of the money supply would, by raising interest rates, invoke economizing on money balances.

How should these arguments be evaluated? That income velocity tends to rise in periods of prosperity and to decline in recession has long been known. There is therefore every reason to believe that a central-bank policy of holding the money supply constant will not prevent a rise of expenditures for output when the marginal efficiency of investment is rising. But there is no convincing evidence that the rise of expenditures could not effectively be controlled by reducing the money supply. These critics also tended to overestimate the role played by restriction of the money supply in producing the increase of velocity. The latter would have occurred to some extent even if the money supply had been increased enough to prevent rising demands for credit from increasing market rates of interest. Faced with rising opportunities for profitable internal investment and prospects of rising cash receipts, business firms would have economized on their cash balances. So would households expecting larger future incomes. And, to the extent that a rising money supply encouraged inflation and an inflationary psychology, it would serve to increase velocity.

Lags in the Effects of Monetary Policy

The reintroduction of flexible, anticyclical policies has raised another very important question: Do such policies really tend to stabilize expenditures for output, or do they actually initiate and accentuate cyclical fluctuations? Those who favor such policies argue, at least implicitly, that the operational lags of monetary actions are short, and that most of the effects of any given action will be achieved within a year. Because of this, monetary policy can operate in a stabilizing manner. For example, expansionary actions taken at or near the beginning of a recession will

have achieved their effects before the next boom, and restrictive actions taken to contain a boom will also achieve their effects rather quickly.

This position has now been challenged, especially by Professor Milton Friedman. He believes that monetary action is effective only with a lag distributed over such a long period of time that flexible policies followed for anticyclical reasons are actually procyclical. For example, expansionary actions taken to fight a recession have little effect for several months, but are likely to "boom the succeeding boom." And restrictive actions to contain a boom are likely, after a lag, to bring on a recession, or at least to accentuate recessionary pressures. Friedman therefore believes that flexible, anticyclical monetary policies should be abandoned, and that the Federal Reserve should confine itself to a steady increase of the money supply at an annual rate approximating the growth rate of our capacity to produce.

Who is right? Friedman's extensive statistical evidence has been widely disputed, as have his interpretations and policy prescriptions. A majority of monetary economists still believe that anticyclical actions are beneficial rather than harmful, but most admit that more information about the timing of the effects of monetary actions is needed.

24. Monetary Policy Since 1959

Only twice during its first 45 years was the Federal Reserve System impelled to adopt more restrictive or less expansionary policies because of its own or the nation's reserve position. One of these exceptions was in 1920; the other, in 1931. During the rest of the time, the United States not only maintained a strong international-reserve position, but also tended to have a surplus in its over-all balance of payments. We have already noted the huge gold inflows in 1915 to 1917 and the further inflows in the early 1920s that concentrated more than 40 percent of the world's monetary gold stock in the United States by 1924; the further inflows in the late 1920s and the first year and a half of the 1930s; the golden avalanche following 1933; and the influx of still more gold between the end of World War II and the end of 1949. On the latter date, the United States held about two-thirds of the world's gold reserves.

By the autumn of 1960, this happy era had ended, at least temporarily. The United States had a large deficit in its over-all balance of payments, its net international-reserve position had shrunk, and there had arisen doubts concerning the ability of the United States to prevent a depreciation of the exchange rate on the dollar. At the same time, the American economy was in a state of recession, with considerable amounts of unemployment and excess capacity. Domestic conditions called for strongly expansionary monetary policies and the international situation called for credit restriction. Which should it be? Could domestic and international objectives be made compatible? If so, how? If not, which should be promoted, which sacrificed, and to what extent? More than three years later, satisfactory answers had not yet been found, and many were wondering when, if ever, the nation would regain its old freedom of monetary policy. Let us now see how this situation developed.

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BACKGROUND

In the early years following World War II, while war-torn and war-deprived countries were still in process of reconstruction and restocking, demands for American exports were almost insatiable. Our net exports of goods and services were large enough to enable us to make large amounts of unilateral transfers in the form of foreign aid and large loans to the rest of the world and still to increase our gold reserves. This came to an end about the time of the outbreak in Korea. As shown in Table 24–1, we

TABLE 24–1. United States Balance of Payments, 1950–1962
(In millions of dollars)

Year	Balance on Goods and Services	Over-all Balance [Surplus or Deficit (—)] (equals ΔG — ΔL)	Change in Gold and Convertible Currencies (ΔG)	Change in Liquid Liabilities to Rest of World (ΔL)
1950	$ 1,779	—$ 3,580	—$1,743	$ 1,837
1951	3,671	— 305	+ 53	358
1952	2,226	— 1,046	+ 379	1,425
1953	386	— 2,152	— 1,161	991
1954	1,828	— 1,550	— 298	1,252
1955	2,009	— 1,145	— 41	1,104
1956	3,967	— 935	+ 306	1,241
1957	5,729	+ 520	+ 798	278
1958	2,206	— 3,529	— 2,275	1,254
1959	134	— 3,743	— 731	3,012
1960	3,825	— 3,925	— 1,702	2,223
1961	5,143	— 2,461	— 742	1,719
1962	4,815	— 2,181	— 907	1,274
Total, 1950–1959	$23,935	—$17,465	—$4,713	$12,752
Total, 1950–1962	$37,718	—$26,032	—$8,064	$17,968

have had deficits in our over-all balance of payments during every year except two since the end of 1949. During every year, we had a positive balance on goods and services. For the years 1950 to 1959, inclusive, these aggregated $23.9 billion. But huge as they were, these net receipts on goods and services account were not sufficient to cover our net payments to the rest of the world in the form of unilateral transfers and net purchases of long- and short-term claims. The result was an aggregate over-all deficit in the 1950 to 1959 period of $17.5 billion. Of this, $4.7 billion was covered by net gold sales and $12.8 billion by net increases in our short-term liabilities to the rest of the world. These trends con-

tinued through the early 1960s. The cumulative deficit for the years 1950 to 1962 was $26 billion, which was covered by gold losses of $8 billion and increases of $18-billion in short-term liabilities to the rest of the world. Through the first half of 1963, the deficit was at an annual rate of about $3 billion, and no one could foretell when it would be eliminated, or even reduced significantly.

In the beginning, the appearance of deficits in our balance of payments was welcomed as almost wholly beneficial. A general reaction was, "only good can result from a loss of gold by the United States. It is about time that the country traded some of its sterile gold for useful goods or income-yielding assets and augmented the reserves of other countries, who need them so badly." However, the continued deficits in our balance of payments, which tend to decrease our stock of gold, to increase our stock of short-term liabilities to the rest of the world, or both, lower the ratio of our gold to these liquid liabilities. Even at the end of 1959, our gold stock of $19.5 billion was still greater than our total short-term liabilities to the rest of the world, which amounted to $19.4 billion. This is an abnormally high ratio of gold to short-term liabilities for a country whose currency is at the center of a gold-exchange system. London ordinarily operates with a far smaller gold ratio. Nevertheless, officials began to worry about questions such as these: What will be the outcome if deficits continue? Is there danger that other countries will be unwilling to increase their holdings of dollars, and even demand that some of the existing claims be paid in gold? Will large outflows of short-term funds occur and put the system under serious strain? Such fears were not baseless. And the cumulative effect of our deficits is to provide the rest of the world with power to put the dollar under pressure.

Our deficits provided the rest of the world with tremendous amounts of liquidity. We took none of the new gold currently becoming available from gold production and from sales by the Soviet Union, leaving this to be added to the reserves of other countries. We also added $17.5 billion to foreign liquid assets through our deficits during the 1950 to 1959 period. These funds were initially made available in the form of claims against dollars, but central banks and governments could, at will, convert them into gold. A large fraction of these funds flowed into official reserves. However, large absolute amounts remained at the disposal of foreign banks and other private holders.

By increasing the liquidity of the rest of the world, our continuing deficits played a major role in restoring a system of relatively free, multilateral trade and payments. We have already described the shackling system of exchange controls and trade restrictions prevailing in the early

postwar period. These not only restricted and distorted international trade, but also reduced to a trickle the flows of private international capital. Every nation welcomed inflows of funds, but those restricting outflows were not attractive to foreign investors. All this began to change, slowly at first and then more rapidly, as more of the industrialized countries improved their balance-of-payments and international-reserve positions. By 1960, most of the financially important countries had removed practically all official restrictions on short-term capital movements. The principal international financial markets were again interlinked by relatively free trade in funds.

Thus, the continuing American deficits contributed in three closely related ways to the increased international vulnerability of the dollar:

1. By decreasing the ratio of American gold to its short-term liabilities
2. By providing foreign central banks, governments, and private holders with large amounts of liquid funds, which they could move from one financial center to another
3. By contributing to the removal of official restrictions on international movements of capital and especially of short-term funds.

It seems likely that movements of short-term funds between the United States and other principal financial centers were more responsive to interest-rate differentials in the early 1960s than they had ever been before. This is only in part because of the removal of official restrictions. Free flows of funds had been permitted in many earlier periods. Many other developments also contributed. Among these were: more rapid and cheaper methods of communicating information about market conditions and opportunities, closer relationships between American bankers and businessmen and their counterparts abroad, the rise of business organizations doing business in many countries, greater sophistication of American bankers in the field of international finance, development of new techniques in international finance, and so on. This greater fluidity of capital flows has much to commend it. However, it has proved on several occasions to be highly disturbing to countries receiving inflows as well as to those suffering outflows.

Let us now describe briefly some principal domestic economic developments in the United States since the end of 1959.

DOMESTIC DEVELOPMENTS

As indicated in Table 24–2, the expansion of national output that had begun in April, 1958, continued into the second quarter of 1960. However, the rise of production was so sluggish that, even in this period,

unemployment averaged 5.1 percent of the civilian labor force, considerably above the levels prevailing at the top of the 1953 and 1957 periods of prosperity. It was largely because of this sluggish growth and

TABLE 24-2. Some Indicators of Economic Conditions in the United States, 1960-1963

Quarter Period	GNP at Annual Rates (in billions)	Unemployment of Civilian Labor Force (in percent)	Yield Rate on Three-Month Treasury Bills	Money Supply (in billions)
1960				
1st	$501.7	5.1	3.87	$139.5
2nd	504.8	5.1	2.99	138.7
3rd	503.7	5.6	2.36	138.4
4th	503.3	6.5	2.34	139.3
1961				
1st	500.8	6.8	2.35	140.2
2nd	513.1	6.8	2.30	141.1
3rd	522.2	6.9	2.30	141.4
4th	538.6	6.3	2.46	144.0
1962				
1st	545.0	5.6	2.72	144.0
2nd	552.0	5.5	2.71	144.2
3rd	555.3	5.6	2.84	145.4
4th	563.5	5.5	2.81	146.9
1963				
1st	571.8	5.8	2.91	148.7
2nd		5.9	2.91	149.4

excessive unemployment that the Federal Reserve, in early 1960, began to ease its degree of restriction. About mid-1960, the economy began to slide into a recession, which continued into the first quarter of 1961. The actual decline of GNP was very small, less than 1 percent. However, this small decline of output in the face of a continuing growth of the labor force and continuing increases in output per man-hour produced a sharp rise in unemployment. By the fourth quarter of 1960, unemployment had reached 6.5 percent, and more than a year was to pass before the rate again fell below this level.

The decline of business activity came to an end in the first quarter of 1961, to be followed by a rise that was still in process in the third quarter of 1963, and that was expected to continue for some time. By mid-1963, GNP was more than 15 percent above its level of two years earlier. Since prices remained almost completely stable, this represented a rise of real output. However, this rate of growth was far too sluggish to match the

increase in productive capacity provided by a growing labor force, continuing advances in technology, and an increasing stock of capital goods. The result has been a persistence of excess capacity and an unemployment rate that doggedly refuses to fall below 5.5 percent. This can hardly be called a state of "maximum production and employment" and "the highest sustainable rate of economic growth."

Federal Reserve policies during this period will be analyzed in some detail in a later section, but some of their major characteristics will be noted here. The first response of the Federal Reserve to the onset of recession in mid-1960 was to move toward a more liberal policy. By purchasing securities in the open market, and by lowering reserve requirements slightly, it enabled banks to reduce their borrowings and to increase their excess reserves. Moreover, discount rates, which had been at 4 percent, were lowered to 3½ percent in June and to 3 percent in August, 1960. These actions, together with decreased demands for funds, brought a reduction of open-market interest rates. For example, the yield on 90-day Treasury bills, which had averaged 3.87 percent in the first quarter and 2.99 percent in the second quarter, declined to 2.36 percent in the third quarter of 1960. But there the decline virtually stopped. From that time through the third quarter of 1961, the yield on 90-day Treasury bills ranged between 2.30 and 2.35 percent. Thereafter it was pushed up somewhat, despite continuance of high rates of unemployment. By the end of July, 1963, it had risen above 3 percent, and on July 16, the discount rate was raised to 3½ percent. Thus, the Federal Reserve had deliberately limited the fall of short-term interest rates and then pushed them up. And the major purpose was to limit the outflow of short-term funds.

Federal Reserve policies during this period were not aimed at a reduction of the money supply. The latter rose about $10 billion over the three-year period beginning in early 1960, or about 7 percent. Time and savings deposits grew more rapidly. But monetary policy was certainly not as expansionary, nor was the growth of the money supply as rapid as in earlier periods of comparable unemployment and excess capacity. The major reason for this was concern about the balance of payments.

We shall now survey some of the more important international developments during this period. It should be kept in mind that Federal Reserve and government officials had two principal concerns in this field:

1. *To eliminate, or at least to reduce, the deficit in our balance of payments.* Officials were fully aware that the deficit resulted, not from any one payment item, but from all receipt and payment items, and that a

broad attack on the problem was appropriate. However, they paid special attention to capital outflows, and especially to movements of short-term funds, partly because these proved to be so large and partly because they could be influenced by various types of monetary action. Foreign short-term loans by Americans, as a payment item, tend to increase the size of our deficit. These are of several types: loans by American banks, purchases of deposits and other short-term claims abroad by our banks and other lenders, and so on. Withdrawals of funds held here by private foreign holders do not appear as a part of our deficit because they tend to reduce our short-term liabilities to the rest of the world. But they do transfer these claims to foreign central banks and governments and put the latter in a position to demand more gold.

2. *To minimize the extent to which holders of dollar claims would demand that they be paid in gold.* As already noted, we do not pay gold to private foreign holders of claims against dollars, but we do stand ready to pay gold to foreign central banks and governments. Past experience, especially in 1958, had indicated that these holders tend to shift to gold when short-term rates in this country become low relative to rates in other major financial centers. One major purpose, therefore, was to persuade these official holders to continue to hold claims against dollars.

INTERNATIONAL DEVELOPMENTS

As 1959 drew to a close, the principal countries of continental Europe, and especially the Common Market countries, were in a stage of high prosperity, with economic growth rates considerably above that of the United States. Unlike the United States, they did not slide into a recession in 1960. Instead, their boom continued and carried several of them into a state of inflation. At the same time, several of them (notably, West Germany, France, the Netherlands, and Italy) had achieved strong international-reserve positions and had large surpluses in their balances of payments. The Deutsche mark had become one of the "hardest" currencies in the world, backed by huge international reserves and a very large current surplus in the German balance of payments. It was under these conditions that several continental countries, notably Germany, restricted credit in the summer and autumn of 1960. Britain also restricted credit to improve her balance-of-payments position.

At the beginning of 1960, before the Federal Reserve relaxed its restrictive policy, short-term, open-market rates in New York were above those in the principal foreign markets to which short-term funds might flow in volume, except for Canada. However, these relationships were

sharply reversed as the Federal Reserve shifted to an expansionary policy and some principal foreign countries restricted credit. For example, in August, 1960, when the 90-day Treasury bill yield in the United States was 2.30 percent, rates on comparable claims were 5.58 percent in Britain, 4.88 percent in West Germany, 4.05 percent in France, and 2.53 percent in Canada. An outflow of short-term funds from the United States was only to be expected under these circumstances, outflows that were only a little less unwelcome to recipient countries, trying to restrict credit to fight inflation, than they were in the United States.

TABLE 24–3. Yields on Treasury Bills and Other Short-Term, Open-Market Paper in Selected Financial Centers, 1960–1963
(In percent per annum)

Period	U.S. 3-Month Treasury Bills	Canada 6-Month Treasury Bills	U.K. 3-Month Treasury Bills	Germany 30–60 Day Treasury Bills	France Day-to-Day Money	Switzerland Private Discount Rate
Jan., 1960	4.35	4.81	4.07	3.75	3.91	2.0
June, 1960	2.30	3.13	5.58	4.88	4.53	2.0
Aug., 1960	2.30	2.53	5.58	4.88	4.05	2.0
Mar., 1961	2.39	3.21	4.48	2.50	3.70	2.0
Jan., 1961	2.33	2.69	4.50	2.25	3.76	2.0
June, 1962	2.73	4.48	3.80	2.25	3.59	2.0
April, 1963	2.90	3.58	3.71	2.63	3.43	2.0

SOURCE: *Federal Reserve Bulletins.*

At first, these outflows from the United States seem to have been induced solely by interest-rate differentials. Soon, however, they were reinforced by speculative movements reflecting decreased confidence that the exchange rate on the dollar would be maintained. Rumors that Kennedy, who was widely expected to be elected, would devalue the dollar were not helpful. By October, 1960, the dollar price of gold in the London market had begun to rise dramatically. From its earlier level of around \$35.09 an ounce, the price rose erratically, and on October 20 it reached about \$40. It then declined somewhat, but, in mid-January, 1961, was still about \$35.43. Not until March did the London price fall below the cost of buying gold in New York. In the meantime, funds continued to flow to London, Frankfurt, and other European financial centers. It is impossible to estimate precisely the size of the outflow of short-term funds from the United States during 1960, since so many of them are hidden in unrecorded transactions. However, the outflow was at least \$2 billion, and probably considerably more.

Two developments helped to restore confidence in the dollar and to

lower the dollar price of gold in London. One was the establishment of a "New York-London Gold Bridge." As the price of gold mounted, the Bank of England sold gold to limit the rise. The United States then agreed to replenish British supplies of gold used for this purpose. Most of the leading central banks of Europe were soon cooperating. They agreed to supply, if necessary, large amounts of gold to limit its price in London and to buy gold only in ways that would not serve to raise its price. In February, 1961, President Kennedy stated emphatically, and apparently persuasively, that the United States would use all its resources to maintain the exchange rate on the dollar, and would not raise the price of gold. He also reaffirmed an executive order that had been issued by President Eisenhower in January, which forbade persons subject to the jurisdiction of the United States to buy or hold gold abroad, and ordered them to dispose of any such holdings by June 1, 1963. These strong statements led to a strengthening of the dollar. Nevertheless, short-term outflows continued, amounting to about $2 billion in 1961, and $1.3 billion in 1962.

As confidence in the dollar improved in the spring of 1961, troubles descended on London. Confidence in the stability of sterling waned as the British balance of payments deteriorated and as rumors spread that the Deutsche mark was soon to be revalued upward in exchange markets. A 5-percent, upward revaluation of both the Deutsche mark and the Netherlands guilder in March, 1961, touched off rumors that these currencies would again be revalued upward and that some other moneys, including sterling, would be depreciated. During the first half of 1961, Britain suffered what the *London Economist* has called "the biggest speculative drain that sterling, or any other currency, has ever experienced." A number of central banks rushed to the rescue, lending the equivalent of $910 million. Britain then drew $1500 million from the International Money Fund and secured a standby credit for an additional $500 million. These measures, together with a sharp restriction of credit in London, were sufficient to restore confidence in sterling and to quell the speculative outflows. Several other international financial crises occurred during the 1960 to 1963 period, all to be met by large international lendings by official agencies and by drawings from the Fund.

Let us now review the principal steps taken by the United States and other countries to limit international flows, to finance those that did occur, and to achieve greater freedom of action for domestic purposes. We shall first survey those measures that are usually considered "international" and then adaptations of monetary policies within the United States.

POLICY RESPONSES

The United States adopted many measures that are not usually considered to be within the scope of "monetary policy," but which were clearly undertaken to affect balance of payments and monetary conditions. For example, it persuaded several governments (notably those of Germany, France, and Italy) to prepay some of their debts to the United States, to buy military supplies in the United States, to bear a larger part of the burden of providing foreign aid, and to open their long-term capital markets to foreign flotations. It also took several steps to reduce American expenditures abroad. For one thing, it decreased the amounts of duty-free imports that tourists could bring back. It limited the freedom of military personnel to maintain their families abroad. It gave still greater preferences to American products in purchasing supplies. And it "tied" government loans and grants to the purchases of American products. In 1963, it was requiring that more than 80 percent of all government loans and grants be spent in the United States. Many of these measures are highly mercantilistic and, if long continued, will tend to lower the efficiency of the world economy.

ADJUSTMENTS OF INTEREST RATES ABROAD

Several countries deliberately lowered their interest-rate levels to inhibit inflows of funds. This was a major reason for a decrease of rates in Japan in August, 1960, and for two reductions in Britain in the last quarter of that year. Germany also reduced her rates in that year, and again in 1961 and 1962. One purpose was clearly to help decrease the outflow from the United States. But recipient countries did not welcome funds that might later prove to be "hot money," and which interfered with their efforts to restrict credit.

To minimize the extent to which they would have to rely on a decrease of their general levels of interest rates to inhibit inflows, some countries adopted special methods. For example, Switzerland reached a gentleman's agreement with its banks that they would not accept new demand deposits from foreigners, that time deposits from foreigners would not receive interest, and that new foreign deposits with a maturity of less than six months would be subjected to a charge of 1 percent per annum. The banks also agreed to avoid using foreign funds to purchase Swiss securities, real estate, and mortgages. Germany imposed high reserve requirements on increases of deposit liabilities to foreigners, and for a time forbade payment of interest on foreign-owned deposits.

OPERATIONS IN EXCHANGE MARKETS

Before 1961, the Federal Reserve and the Treasury did not buy and sell foreign moneys to influence the dollar exchange rate. They kept the dollar within narrow limits solely by purchasing and selling gold. In March, 1961, the Treasury broke this precedent by reactivating the Exchange Stabilization Fund, and by beginning to buy and sell convertible moneys. The account was managed by the Federal Reserve. A year later, in March, 1962, the Federal Reserve began similar operations on its own account. Operations for both the Treasury and the Federal Reserve are under this jurisdiction of the FOMC and are carried out through the Federal Reserve Bank of New York. The manager of these accounts now operates in the spot-exchange market (the market for immediate delivery of the moneys involved) and in the forward-exchange market, which deals in contracts to deliver or to receive moneys at some stipulated time in the future.

Operations in spot markets can have several purposes. One is to affect expectations concerning future rates. For example, purchases of dollars (that is, sales of foreign moneys) to limit or prevent a decline of the exchange rate on the dollar may succeed in creating expectations that the dollar will not decline. Federal Reserve sales of foreign moneys to buy excess dollars in exchange markets can also prevent the latter from being sold to foreign central banks, which might use them to demand gold. Federal Reserve operations in spot markets have been in significant volume, as have those of some other cooperating central banks and governments.

Operations in forward markets also affect expectations concerning the future course of exchange rates and are sometimes used for this purpose. However, we shall concentrate here on the use of this device to affect the net rate of return that investors of a country can make by lending in a foreign financial center at some given level of interest rates there.

To illustrate the principles involved, let us suppose that an investor in some foreign center, such as London or Frankfurt, has a certain amount of money that he would lend in New York if the net return from lending there were attractive relative to the rate of return at home. For simplicity, let us assume that the contemplated period of lending is one year. If the interest rate at home is r_H and he lends these funds for a year, he will have at the end of the year the invested amount times $(1 + r_H)$. To lend in New York, he will have to buy dollars in the spot market at some exchange rate, which we shall designate by S. This is the spot-exchange

rate on the dollar, stated as the number of his currency units required to buy one dollar. Thus, he will have for lending in New York a number of dollars equal to the amount of his own currency offered divided by S. For example, if his funds amount to 4 million Deutsche marks (DM) and $S = \$1.00 = 4$ DM, he will have \$1 million for lending in New York. If he lends in New York at a rate of interest r_N, he will have in New York at the end of the year a number of dollars equal to the amount of the loan in his own currency times $1/S(1 + r_N)$. But if he takes no further action, he will expose himself to the risk that the DM value of the dollar at the end of the loan period will be lower than the rate S at which he bought dollars, and that this will offset, or more than offset, his gain from lending abroad. It is therefore common to hedge short-term loans or borrowings in foreign moneys in "forward transactions." In this case, the lender would at the time of the loan sell dollars for forward delivery at or around the time of the expiration of the loan. That is, he will buy his own currency forward. Let F equal the forward-exchange rate on the dollar, stated as the number of his currency units per dollar. If the investor sells his dollars at the forward rate F, he will be assured of an amount of his own currency equal to $F[1/S(1 + r_N)]$, or $F/S(1 + r_N)$.

Thus, the relative advantage to an investor of lending at home and lending abroad depends not only on the relative heights of interest rates at home and abroad (on r_H and r_N), but also on F/S, the price at which the foreign money is sold in the forward market relative to the price paid for it in the spot market. A foreign investor contemplating the lending abroad of a certain amount of his money would make this kind of a comparison:

Value at the end of a year in my currency if I lend at home:	Value at the end of a year in my currency if I lend abroad:
$(1 + r_H)$	$F/S(1 + r_N)$

If F and S are exactly equal (that is, if $F/S = 1$), he neither gains nor loses on his exchange operations, so that his decisions will depend on the relative heights of r_H and r_N. But suppose that F is "at a discount" relative to S, and that $F/S = 0.98$. On his exchange operations, he will lose an amount equal to 2 percent of his principal.[1] Investment in New York is rendered less attractive unless interest rates there are sufficiently

[1] The discount or premium on forward as compared to spot rates is stated as a percent per annum to make it comparable to interest rates. Thus, it is $F/S \times 365/N$, where N is the number of days covered by the forward contract. It was to avoid such computations that we assumed the period to be one year.

higher relative to interest rates at home. But a discount on the forward dollar is the same thing as a forward premium on the other currency. This tends to make more profitable the movement of funds out of dollars, for by lending abroad, one receives not only the interest rate prevailing there but also the premium on sales of foreign currencies forward.

Suppose, however, that the forward rate on the dollar is "at a premium" relative to the spot rate, so that $F/S = 1.02$. Foreigners could earn an amount equal to 2 percent of principal simply by purchasing dollars spot and selling them forward. Thus, interest rates in American markets need not be so high relative to those abroad to attract or retain funds. A forward premium on the dollar is the same thing as a forward discount on other currencies. Such a situation tends to curb outflows from dollars because the lender loses an amount equal to the difference between what he paid for foreign currencies in spot markets and what he receives for them in forward markets.

On several occasions during the 1960 to 1963 period, outflows of funds from the United States were encouraged by the existence of large forward discounts on the dollar. This was especially serious when the countries whose currencies were at a considerable forward premium also had interest rates above those in New York. Several foreign central banks as well as the Federal Reserve and the Treasury therefore bought dollars forward (that is, they sold the foreign currencies forward) to decrease the forward discount on the dollar. For example, in late 1960 and in 1961 the German Bundesbank, in an effort to encourage short-term investment abroad and to discourage inflows, offered to purchase forward dollars from its banks at a premium. The Bank of Italy entered into similar arrangements. The United States Treasury first began to operate in the forward market in March, 1961, and the Federal Reserve entered on its own account a year later. Some of their operations have been very large. For example, at one time in 1961, the Treasury had sold forward more than 1 billion Deutsche marks, equivalent to about $250 million. At another time in 1962, forward sales of Swiss francs amounted to nearly $150 million. Similar operations occurred in Netherlands guilders and Italian lire.

Operations of these types in both spot- and forward-exchange markets serve useful purposes and may become permanent monetary instruments for the following reasons:

1. They can be used in influence expectations concerning the future course of exchange rates and thus to influence speculative flows of short-term funds.

2. By influencing forward premiums and discounts, they can reduce the extent to which given interest-rate differentials induce flows of funds.
3. They can for at least a time reduce gold losses.

Thus, they can be very helpful in dealing with speculative flows and for limited periods of time. They do not, of course, correct basic imbalances in international payments.

International Lending Arrangements

As noted earlier, the period since 1960 has witnessed a truly remarkable growth of international arrangements for loans to countries with deficits in their balances of payments. The United States has been helped by many sources of foreign credits:

1. Foreign Cooperation. There has been a willingness of foreign central and governments to show understanding and restraint in continuing to hold claims against dollars instead of demanding gold.
2. Foreign prepayments on debts owed to the United States, notably those by Germany, France, and Italy, have been helpful.
3. Foreign loans have been made to the United States Treasury. The Treasury has on several occasions borrowed foreign currencies.
4. Reciprocal Currency Agreements, or swap arrangements with foreign central banks, have been made. In mid-1963, the Federal Reserve had outstanding swap arrangements aggregating $1.6 billion with the Bank for International Settlements and with nine foreign central banks.
5. There is a $6-billion lending agreement among 10 industrial countries.
6. In July, 1963, the United States received a $500-million standby credit from the International Monetary Fund.

Up to this point, we have concentrated on measures taken abroad and by the United States in the international sphere, often in cooperation with other countries. Let us now deal with American policies that are usually considered "domestic," but which clearly have international effects and have been partly shaped by international considerations.

U.S. "DOMESTIC" MONETARY POLICIES

Ever since 1960, the Federal Reserve has faced an apparent dilemma. Persistent, excessive unemployment has indicated a more expansionary monetary policy, while the international situation seemed to require restriction. It is not surprising, therefore, that the Federal Reserve has tried to develop devices for minimizing the effects of credit restriction on domestic spending and of maximizing effects in discouraging outflows of funds. Its efforts have taken two principal forms: (1) to raise

interest rates available here to foreign holders and others who might export funds relative to rates paid by domestic borrowers, and (2) to raise short-term rates relative to long-term rates.

Changes in Regulation Q

Ever since 1933, the Board of Governors has established ceilings on the interest rates that banks may pay on various classes of time and savings deposits. These ceilings have long been controversial, even within the banking community. Some defend them as necessary to prevent banks from engaging in excessive competition and forcing deposit rates so high as to lower the profitability of banking and therefore to tempt banks to make highly risky loans in order to cover their costs. Others charge that the ceilings are damaging to commercial banks and probably to the nation because they prevent these banks from competing effectively for savings with such institutions as savings-and-loan associations that pay higher rates. Another, and, under the circumstances, a persuasive, argument against the ceilings became prominent after 1960: Big banks in New York and a few other centers complained that the low ceilings prevented them from competing effectively for foreign funds, with the result not only that deposits were lost, but also that outflows of funds were increased.

TABLE 24–4. Maximum Interest Rates Payable on Time and Savings Deposits (percent per annum)

	Effective Date			
Deposits	Jan., 1936	Jan., 1957	Jan., 1962	July 16, 1963
Savings deposits held for:				
1 year or more	2½	3	4	4
less than 1 year	2½	3	3½	3½
Time deposits payable in:				
1 year or more	2½	3	4	4
6 months–1 year	2½	3	3½	4
90 days–6 months	2	2½	2½	4
less than 90 days	1	1	1	1

SOURCE: *Federal Reserve Bulletin.*

In January, 1962, the ceilings were raised so that the highest rates available on time deposits increased from 3 to 4 percent. In October of that year, Congress permitted the Federal Reserve to eliminate, for a

period of three years, ceilings on rates paid on deposits of foreign central banks and governments. Then, in July, 1963, the Board of Governors raised to 4 percent the ceilings on all types of time deposits except those with original maturities of less than 90 days. Thus, banks were permitted to pay higher rates, not only to foreign private holders, but also to American firms that might lend abroad.

A major purpose of these various actions was, of course, to make higher returns available to holders of dollar deposits without necessarily raising the rates paid by American borrowers. But some of the actions had important domestic repercussions, for by raising rates paid to domestic savers, they induced a rapid increase of domestic holdings of time and savings deposits at commercial banks.

"Operation Nudge"

The height of long-term interest rates in the United States relative to those abroad obviously influences the flow of long-term funds to other countries. However, during this period, Federal Reserve and Treasury officials believed that short-term rates were the more important in determining international flows of funds, whereas long-term rates were the more important in determining domestic investment spending. They therefore sought to raise short-term rates relative to long-term rates. Note that they faced two separable policy problems: (1) to regulate the over-all reserve positions of the banks, and thus influence the general or average level of interest rates, and (2) to influence the relative heights of short-term and long-term rates. The attempts of the Federal Reserve and the Treasury to raise short-term relative to long-term rates are usually called "Operation Nudge," though, by 1963, some were referring to these operations as "Operation Twist."

To illustrate the principles involved, assume that the Federal Reserve has already determined the over-all reserve position of the banks. The basic technique of the "nudge" is to increase the supply of Treasury bills and other short issues available to banks and the public relative to the supply of long-term government bonds. This is done through both Treasury debt-management operations and Federal Reserve open-market operations. For its part, the Treasury increases the supply of Treasury bills and other short maturities outstanding. It does this in several ways: by outright "swaps" of Treasury bills for outstanding longer maturities, by concentrating new issues in the short-term area, by purchasing longs rather than shorts for its own investment accounts, and so on. These operations tend, of course, to decrease the average maturity of the federal debt. To prevent this, or at least to decrease its extent, the Treasury has

used an "advance refunding" technique. That is, by issuing longer-term obligations, it has refunded issues that still have a few years to run.

In comparable ways, the Federal Reserve can increase the supply of Treasury bills and other short maturities available to the banks and the public: by selling shorts and buying longs, by purchasing longs rather than shorts to supply bank reserves, and by providing banks with reserves or excess reserves by other means that do not require it to purchase shorts. To do this, however, it had to abandon its controversial "bills-only" (or "bills-usually") policy. Some steps in this direction were taken in late 1960, when the FOMC began to buy certificates, notes, and bonds with maturities up to 15 months. On February 20, 1961, it abandoned "bills-only," announcing, "The System Open-Market Account is purchasing in the open market U.S. government bonds and notes of varying maturities, some of which will exceed five years." Since that time, it has dealt in a wide range of maturities. However, its swaps and purchases of long maturities have been in only modest volume.

Its desire to avoid decreasing the supply of short maturities available to the public may also have been a minor factor in the Federal Reserve's decisions to meet a part of bank needs for reserves by allowing them to count all of their vault cash as reserves and by reducing reserve requirements against time and savings deposits from 5 to 4 percent in late 1962.

Though assessment of its effects is difficult, "operation nudge" does seem to have succeeded in some degree in limiting the rise of long-term rates. It might have been even more successful if the Federal Reserve had engaged in very large swap operations or if the Treasury had been willing to issue still more short-term debt. In July, 1963, after the Federal Reserve increased its discount rate from 3 to 3½ percent and was allowing short-term rates to rise, there were rumors that still larger operations of this type would be undertaken to prevent or limit a rise of long-term rates. There were widespread debates on such questions as: How much is it possible to raise short-term rates relative to long-term rates? As short-term rates rise, at what point will private holders simply sell long terms and buy shorts, thus limiting the effectiveness of the operation?

RELATIVE ROLES OF MONETARY AND FISCAL POLICIES

Throughout the postwar period, many have believed that too much reliance has been placed on monetary policy and too little on fiscal policies to promote the nation's economic objectives. These people have been especially critical of the long delays involved in changing tax

and expenditure programs, and of the failure to take prompt and effective fiscal actions to bring the economy out of recessions. This position is strongly reinforced by the presence of balance-of-payments problems. It can be argued persuasively that, under these circumstances, a monetary policy sufficiently expansionary to achieve domestic output, employment, and growth objectives may simply be unavailable, and that either these objectives or balance-of-payments objectives will have to be sacrificed if an expansionary fiscal policy is not employed. An expansionary fiscal policy that succeeded in increasing domestic income and output would tend to worsen our balance of payments by increasing imports. But, unlike an expansionary monetary policy, it would not tend to lower interest rates or to encourage capital exports. In fact, to the extent that it succeeded in increasing the demand for domestic output and in raising the expected profitability of domestic investment, it would tend to keep funds at home.

The point here is not that a country facing balance-of-payments problems can use an expansionary fiscal policy to promote domestic objectives without endangering its international-reserve position. The point is rather than an expansionary fiscal policy is less dangerous in this respect than an expansionary monetary policy that lowers interest rates.

Those who make fiscal policy in the United States seem not to have learned the extent to which the use of monetary policy for expansionary purposes has been limited by balance-of-payments considerations, the extent to which the great sensitivity of short-term funds to international interest-rate differentials has limited the ability of nations to follow independent monetary policies, and the necessity of relying more heavily on timely and flexible fiscal policies.

CONCLUSIONS

In the third quarter of 1963, it was still impossible to foresee the end of the type of situation that had prevailed since 1960. The deficit in our balance of payments persisted and had not yet fallen below its level in 1962. Many hoped that it would be reduced and perhaps even turned into a surplus by growing inflationary pressures in Europe, but none could be sure whether or when this would happen. With unemployment still well above 5 percent, the Federal Reserve had increased its discount rate from 3 to 3½ percent, and was allowing short-term rates to rise. A more expansionary monetary policy, and lower interest rates certainly were not in prospect. Symbolizing its determination to defend the exchange rate on the dollar, the United States had arranged a $500-million

standby credit at the International Monetary Fund. A tax-reduction program to stimulate domestic demands for output was before the Congress, but its progress was slow indeed.

Both recent experience and future prospects had raised many questions:

1. When, if ever, will the United States regain its freedom to adopt expansionary monetary policies to promote domestic objectives? Will the large volume of short-term liabilities to foreigners continue to be a limiting force even after the deficit is eliminated? In more general terms, will the freedom of short-term capital movements and their sensitivity to interest-rate differentials severely limit the ability of nations to follow independent monetary policies?

2. Will the international reserve system, relying so heavily on multiple bilateral arrangements, prove to be stable, or will it break down?

3. Will it provide an appropriate rate of growth of international liquidity?

4. Can the United States, within the limitation of a system of fixed exchange rates, achieve, in acceptable degree, its domestic employment, output, and growth objectives? If so, how can this be done? If not, is the maintenance of fixed exchange rates worth the candle?

5. Which, if any, of the many proposed reforms of the international reserve-and-payments system should be adopted?

25. The Future

Monetary and banking institutions and policies appear to be slow-moving and almost static if one looks only at their changes over a span of a year or two. But over the long period of our history, changes in structures, policies, and attitudes have been sweeping indeed. There is no reason to believe that future changes will be any less rapid, sweeping, or controversial. Some cannot yet be foreseen, but others are already visible.

INTERNATIONAL MONETARY STRUCTURES AND POLICIES

The international reserve system and international monetary policies have not yet approached a final stage of evolution. The International Monetary Fund has been highly useful, and it continues to grow in usefulness and prestige. But its policies are still undergoing change, especially those relating to the terms and conditions under which it will make its resources available. The numerous other cooperative lending arrangements among governments and central banks are still developing, but many wonder whether they will prove to be stable and whether they will provide an appropriate behavior of total international liquidity. More people are becoming increasingly doubtful about the desirability of relying so heavily on national moneys as a source and form of international reserves. The pound sterling is still widely held by members of the British Commonwealth as an international reserve, but others seem increasingly reluctant to hold more of their reserves in this form. The future international role of the dollar is still uncertain. Will other countries be willing to increase greatly their holdings of dollar claims? Or will they insist on holding more gold or other moneys? Is it really advantageous to the United States for the dollar to serve as an international reserve if this means that other countries can demand gold at will?

Proposals for reform of the international reserve and liquidity system are numerous and varied. Among these are increases in the price of gold, expanded swap arrangements under which more central banks and governments would agree more firmly to lend larger amounts to each other on more liberal terms, agreements to hold larger amounts of reserves in foreign moneys and less in gold, and expansion of the resources available to the International Monetary Fund. Others contend that the problem can be solved satisfactorily only by the establishment of a true, international central bank endowed with power to create, and to regulate the volume of, claims that nations would agree to hold as reserves and to accept in payments. What the outcome will be is still unclear.

Removal of restrictions on international flows of short-term funds and the sensitivity of these flows to interest differentials have reduced the ability of nations to follow independent monetary policies and have raised various questions. Should nations again try to restrict these flows by direct action despite administrative and other difficulties? Should nations surrender some of their domestic interests and coordinate their policies with those abroad? If so, to what degree?

These and many other questions in the international field have yet to be answered.

DOMESTIC OBJECTIVES

As late as the 1920s, few would have believed that either the Federal Reserve or the government would within a few decades accept responsibility for promoting "maximum employment, production, and purchasing power," "the highest sustainable rate of economic growth," and relatively stable price levels. Though these philosophies are now accepted, we are still in the process of trying to increase their compatibility with each other. One of the great questions yet to be answered is how to secure more favorable behavior of money wage rates and price levels without an unacceptable degree of interference in labor and output markets.

Still to be worked out are more satisfactory relative roles for monetary and fiscal policies. The latter are still overly slow and inflexible.

THE FEDERAL RESERVE

Changes during recent decades have affected the Federal Reserve System in many ways. Perhaps most important has been the rise of new economic objectives accepted and sanctioned by the government. The Federal Reserve cannot deviate far from these or for long; it is a creature

of Congress, it can be directed by Congress, and it is, through many channels, influenced by the values and attitudes of the nation. It therefore faces tasks far more difficult and exacting than those set for it at the time of its establishment or even in the 1920s. Because its responsibilities are of great social importance, its policies and actions are now scrutinized much more closely than ever before by both the public and the government.

Such changes in national objectives and in the responsibilities assumed by government could lead to changes in the structure and control of the Federal Reserve. Under somewhat similar circumstances many other countries have ended the "independence" of their central banks and have placed them under the jurisdiction of the executive branch of government. May something similar happen to the Federal Reserve? It it does, how will monetary policy be affected? And what would be the other implications for the Federal Reserve? Would the 12 separate Reserve banks be continued or would they be merged into one? Would their stock remain with member banks or be purchased by the government?

Whether or not its relation to the executive branch of the government is altered significantly, the Federal Reserve may undergo further internal changes. In its early years, much stress was laid on regional autonomy and adaptation of policies to regional differences in credit conditions. Since then, the emphasis has shifted toward a single national credit policy, and with this has occurred a shift of power away from the regional Reserve banks and toward a centralized authority. Control of open-market operations has been centralized, the Board of Governors has acquired greater power over discount rates, and it is to the Board rather than to the Reserve banks that Congress has delegated new powers to fix and to alter member-bank reserve requirements and to administer margin requirements on security loans and other selective controls. Will this trend toward centralization continue?

Nor is it safe to assume that the instruments available to the Federal Reserve for regulatory purposes will remain unchanged. What will be the future of selective controls? Will the Federal Reserve again be given the power to regulate consumer credit and perhaps also similar powers over residential construction and some other types of credit? If so, what will be the relative roles of general monetary management and selective controls in the future? Even its instruments for general monetary management may be altered. In the 1930s, the System was given an important new instrument—the power to vary member-bank reserve requirements. This has been severely criticized. What will its future be?

Will this power of the Federal Reserve be eliminated or curtailed? Or may it be expanded? For example, may it be extended to all commercial banks, member and nonmember alike, as many have advocated? May it, or some similar instrument, be extended to cover financial institutions other than commercial banks? In the past, the primary purpose of general monetary and credit management has been to regulate the quantity of credit and money supplied by institutions that have the power to create and destroy money. But, with the institutionalization of savings and the huge flows of funds through such entities as life insurance companies, savings banks, and savings-and-loan associations, some have come to argue that it would be useful to regulate the volume of investable funds supplied by these institutions. Will these views prevail?

The relationship of the Federal Reserve to other regulatory agencies in the banking field may also come under scrutiny. There are three such agencies at the federal level: the Federal Reserve, the Comptroller of the Currency, and the Federal Deposit Insurance Corporation. Their jurisdictions overlap in many ways. Through informal agreement, the Comptroller now has primary responsibility for examining and regulating national banks; the Federal Reserve, for state member banks; and the Federal Deposit Insurance Corporation, for nonmember, insured state banks. But these arrangements leave much to be desired. For example, representatives of the FDIC have even been known to advise banks to remain outside the Federal Reserve System. There also remain many problems of reconciling the attitudes and policies of these federal agencies with those of state banking authorities.

THE FINANCIAL STRUCTURE

The whole structure of financial institutions in the United States has undergone tremendous changes since 1914. Perhaps most striking has been the rise of institutions sponsored in one way or another by the federal government: for example, the whole complex of farm-credit institutions, the many new institutions in the housing-credit field, and the Small Business Administration. It cannot be taken for granted that this structure will or should remain static. Even if fully justified at the time of their establishment, some may already have become, or will in the future become, unnecessary or even harmful. On the other hand, similar institutions may be established in other fields.

Private financial institutions other than commercial banks have also undergone great changes. Among these are the phenomenal growth in the number and resources of savings-and-loan associations, the rapid

growth of credit unions in some areas, the greater aggressiveness of mutual savings banks, the rise and rapid growth of pension funds, and so on. These institutions are already serious competitors of commercial banks, both as gatherers of savings and as sources of loan funds. Now there are proposals that federal charters be made available for mutual savings banks and that they and some other institutions be given wider lending powers. Many questions of public policy are posed by such developments. Are present differences in laws and regulations concerning portfolios justified? Should differences in tax treatment be eliminated? In general, should we strive for a financial system composed of "department stores," each doing many types of financial business, or of "specialty shops," each confining itself to only one or a few lines?

The structure of commercial banking has already changed greatly, and continues to change at a rapid rate. In 1920, the nation had more than 29,000 banks; at the end of 1962, despite large increases in population and even greater increases in real income and wealth, it had only 13,439 banks. In 1920, there were fewer than 1300 branch offices; in 1962, there were nearly 12,500. Moreover, group banking (the ownership and control of two or more banks through a holding company) has grown rapidly. The pressure toward multiple office banking is strong and persistent.

The great decrease in the number of banks during the 1920s and 1930s is explained in large part by bank failures. But few banks have failed since that time. Most of those that have disappeared in the recent period have been absorbed in mergers. Table 25–1 shows that the number of banks decreased by 723 in the 1945 to 1962 period. But these totals conceal the most interesting part of the story. In this period, about 1840 new banks were opened, and 2568 ceased operations as separate legal entities. Of the latter, 2345 were absorbed in mergers, and most were converted into branches of the absorbing banks. Still other banks continued as legal entities but were brought under the control of holding companies. The merger movement would have progressed even faster in the absence of official restraint.

All aspects of the commercial-banking structure are now matters of public policy, for federal and state authorities regulate chartering, branching, mergers, and other methods of bringing banks under common control. It would be pleasant to report that the authorities have effectively promoted quality and convenience of banking service, efficiency, and competition. But a true report must include far too many cases of lack of defensible criteria, promotion and protection of monop-

oly positions, protection of inefficiency, and bickering among regulatory agencies.

Still to be answered satisfactorily are many questions: What kind of

TABLE 25–1. Commercial Banks in the United States, 1945–1962

Year	Number of Banks at Beginning of Period	Net Change During Period	Banks Beginning Operations	Banks Ceasing Operations	Banks Ceasing Operations Because of Merger
1945	14,167	+ 16	119	103	76
1946	14,183	+ 35	148	113	93
1947	14,218	+ 16	113	97	85
1948	14,234	− 13	80	93	78
1949	14,221	− 16	79	95	78
1950	14,205	− 41	69	104	92
1951	14,164	− 32	64	96	80
1952	14,132	− 44	71	115	101
1953	14,088	− 64	65	129	115
1954	14,024	−143	72	215	208
1955	13,881	−125	115	240	231
1956	13,756	− 76	122	198	189
1957	13,680	− 73	88	161	156
1958	13,607	− 67	96	163	150
1959	13,540	− 54	117	171	167
1960	13,486	− 2	132	134	129
1961	13,484	− 40	113	153	137
1962	13,444	− 5	183	188	180
Total, 1945–1962		−728	1846	2568	2345
Adjustment			−6		
			1840		

SOURCE: *Annual Reports of the Federal Deposit Insurance Corporation.*

banking structure do we want? What criteria should be applied in judging applications for charters, branches, and mergers? How should control powers be divided between federal and state authorities? Should the federal government continue to deny to a national bank more liberal branching powers than those possessed by state banks in the state in which it is located? Should federal regulatory powers over banks continue to be divided among the Comptroller of the Currency, the Federal Reserve, the Federal Deposit Insurance Corporation, and the Antitrust Division of the Department of Justice, or should they be centralized? If the latter, where?

CONCLUSIONS

This chapter has not attempted to catalogue all the existing unresolved issues in this field, still less to forecast those that may develop in the future. But incomplete as it is, it should have succeeded in making one major point: There is no reason to believe that the process of change in our monetary and banking objectives, structures, policies, and practices is nearing an end. A wise commentator once observed, "To some problems there is no solution, only an outcome." He might have added, "And the outcome is unlikely to be permanent."

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